

# COAL AGE

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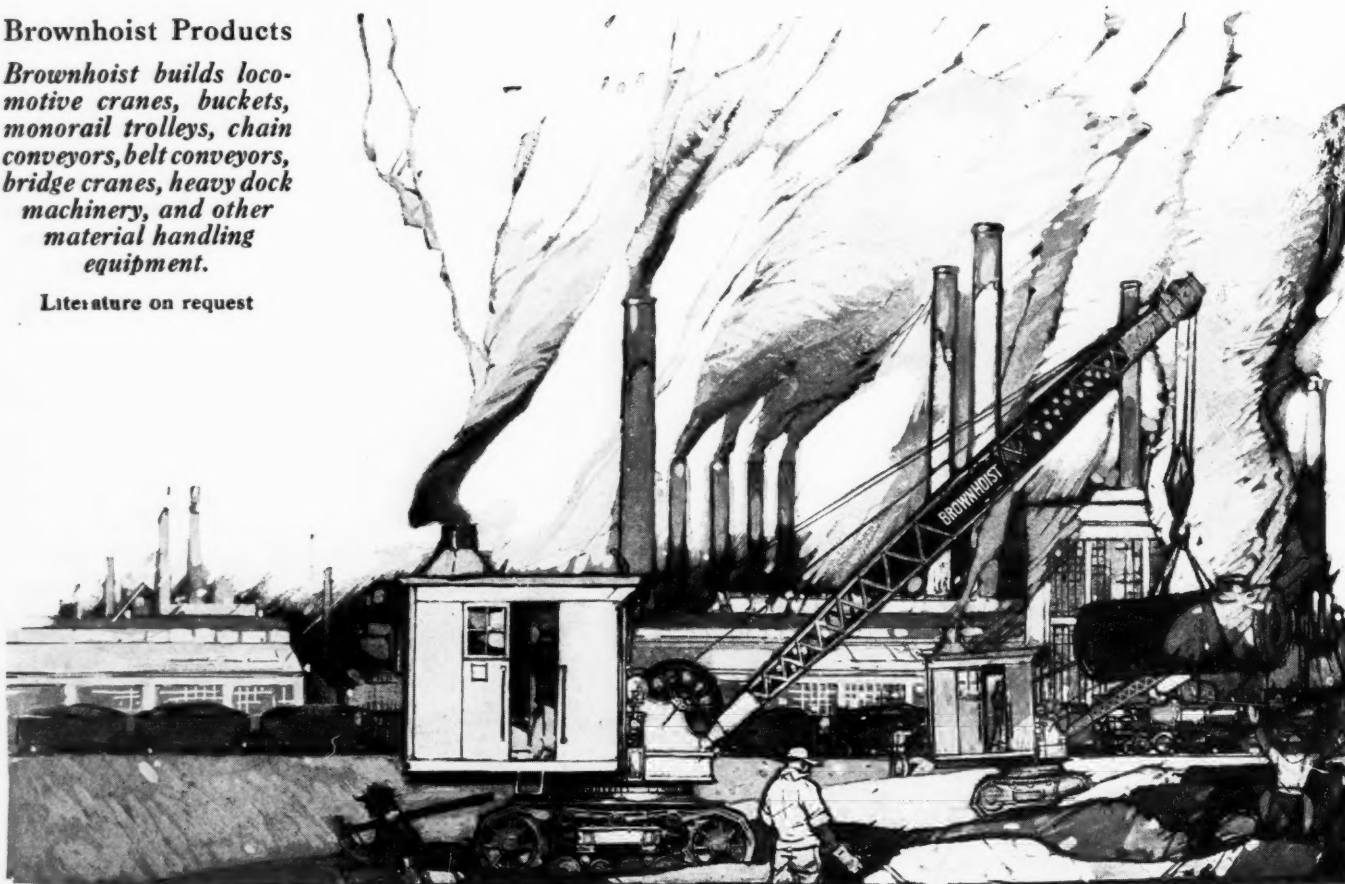
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# COAL AGE

The Only National Paper Devoted to Coal Mining and Coal Marketing

C. E. LESHER, *Editor*

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## Presidential Years

WHAT are we to infer from the recent broadsides proclaiming and proving that the generally accepted conviction that a presidential year means poor business is both false and foolish? L. P. Ayers, vice-president of the Cleveland Trust Co., a statistician of national reputation, and Congressman Martin L. Davey have separately and independently hit that old theory a bump. We have never had a shred of belief in the theory that presidential years made or unmade business or that changes in administration have a tangible influence on the business cycle. It is good to have it proved, however. Perhaps when we have more businessmen with trained minds mixing in the political game there will be less resort to such old adages that one party or the other brings prosperity just because a good crop in a presidential year following a poor crop may re-elect the party in power.

Since 1880, it seems, there have been five lean presidential years and five fat ones. Colonel Ayers' indexes show the presidential year has an even break as between above and below normal. Now there is much talk these days about the influence of the coming presidential year on a new coal-wage contract for next April. Just what influence can it have?

In the first place the influence, if any, must be pronounced and exerted in advance, because the negotiations open in January to renew a contract that expires with the end of March. At that time the political aspects of 1924 will still be in flux. Conventions are months away, policies in the making, Congress a Roman arena for bloc fights. Now it is granted that the powers that be, and perhaps as well those that hope to be, would be in a sorry plight were they to be obliged to stage a presidential campaign under such stress as the coal strike produced in the summer of 1922. One can well imagine that the administration would gladly have such a contest postponed. The memory of the ineffectiveness of Washington in the 1922 conflict is altogether too fresh to invite a repetition.

What brings about a strike? Is political influence any more likely to avoid or postpone such an event than to bring prosperity or decree depression, raise a bumper crop or introduce plague or drought? Hardly. An overheated imagination might picture some power behind whispering to the coal operators that there must be nothing to ruffle the calm sea of 1924 prosperity, and directing that they go forth and give the union miners whatsoever they may demand, but coal operators don't throw their business away after that fashion. No one supposes either that the United Mine Workers will listen to advice from Washington in 1924 any more than in 1922. Their course of action, like all organized labor's course in the country, is not dependent on party politics. The miners will strike or refrain from striking at the dictation of no political group.

No, the government or the party cannot by edict or

by pressure control this situation. Whatever influence the fact of a presidential year may have on labor relations in soft coal will flow from the natural conservatism of individuals who would shrink from stirring up more trouble than is already in prospect. The greatest hope for peace in coal in 1924 lies in the very evident desire of both parties to avoid a dispute, and in no wise is to be attributed to the magic influence of a presidential year.

## Business Statistics

HOW much of the stability that has characterized business this year is to be attributed to sounder knowledge of the course of industry cannot be ascertained with precision. The better knowledge afforded by the regular collection of trade information by the Department of Commerce and published through the Survey of Current Business has met with the hearty approval of industry. The steady drive for continuous operation, the mitigation of unemployment and the softening of alternate booms and slumps, in which Herbert Hoover has been the outstanding leader, is bearing fruit. Beyond doubt what Mr. Hoover did in 1923 is more largely responsible for the even tenor of soft-coal production this year than any other factor.

It must be remembered that all the results so far obtained have been from statistics voluntarily supplied. The trade associations have been encouraged to co-operate with the government. In view of the decree recently entered in the Tile Manufacturers case by which the field of these voluntary trade reports is greatly restricted, if not indeed reduced to the request of some government department, there is raised the larger question as to whether the policy of the Department of Justice is not directed toward the total extinguishment of trade-association effort. Some would devise a method of forcing a showdown between the policies of the departments of Justice and Commerce, but there is the fear that if the question of legality were raised there would inevitably follow a period of uncertainty that would be sure to wreck what even now is left and thus remove the few props that business has.

The coal industry, save for the incomplete co-operation now afforded the Geological Survey, is at a standstill in the statistical field. Groups here and there are seeking a way of increasing the effort on a voluntary basis. The sentiment in favor of making all participate is strengthened by the knowledge that altogether too many coal men are seemingly opposed to any form of publicity of accounts. From a purely selfish business standpoint the coal industry, particularly the soft-coal industry, needs more current information as to its general condition. If it is not willing to undertake voluntary even though incomplete reporting, it must always face attempts to compel the collection of these data.

It is agreed that there is little or no legal ground on which the government can compel such reports, but it must not be forgotten that time can remedy that remissness in the law.

### A Lesson in Power-Plant Design

**T**HERE are two aspects to the subject of power generation of vital interest to coal men: The cost of power to them as consumers, and the decreased demand for coal as efficiency in its use mounts. The direction of movement today is toward utilization at mine power plants of what otherwise would be waste and the demand from distant power plants for the higher grade fuel.

The power-plant engineer who visited the recent Power Show held in New York has gone back to his work with a new vision of the future. The time once was when the power plant was laid out and erected with no thought of the efficiency with which the plant was to operate. This was a question which was supposed to depend more upon the ideas of the operating organization than the equipment put into the plant. Power plants were built and experimentation carried on afterward. Today every detail of the plant and its operation is figured out first and every item and piece of equipment must fit into the plan for most efficient operation. Long before the plant produces power close approximate operating data are available.

The most uninitiated engineer could not help but be impressed with two important facts as he viewed the Power Show exhibits. The first is that the generation of power is developing into a highly specialized industry with hundreds and thousands of pieces of apparatus designed to obtain the highest degree of efficiency in the handling and burning of all kinds of fuel. The second important fact is the rapid stride made in the utilization of the small sizes of coal. Stokers, pulverizers, furnaces, boilers all are being adapted and perfected for the utilization of what we have always considered waste. With the perfection of this equipment and advancement in control and metering accessories we are seeing the power plant revolutionized. Power plants now ten years old are obsolete and must go to the scrap heap unless revamped.

### Keep an Eagle Eye on Mine Supplies

**T**HERE is a more or less exact level at which every coal mine's stock of supplies should be maintained. Keeping it there is more of an art than many a veteran mining official may imagine. And because he does not imagine it he also probably never thinks of computing the cost of carrying too much stock—or too little. Yet all the while his company may be paying heavily for this omission.

The generous habit of buying a gross of brake shoes at a time, even though it takes a year to use that many, simply means that a certain number of dollars that might be working elsewhere for a mine company are kept "frozen" in brake shoes. This loss might be greater than the discount obtained by quantity buying. Who knows, if nobody in the company takes the trouble to figure out after a time study of brake-shoe consumption by that particular company?

On the other hand, penurious buying, aimed to prevent the loss of capital working value, might reduce the stock of brake shoes too low. This would not only deprive

the company of the quantity-purchase discount but also might easily cause the tie-up of equipment waiting for shoes. Here again a loss would ensue, so that the total loss would be greater than that caused by overstocking. This situation is applicable to almost any line of supplies in the whole stock at a mine. The subject is worthy of closest study, especially by those operators who have never delegated a good man to make a careful survey of the problem as it applies to each particular property.

One authority says the cost of carrying excess and obsolete stock in this country amounts to as much as 3 per cent a month, which means \$360 a year on every \$1,000 invested in stock! Mr. Hutchings, in his article in this issue, points to this astonishing expert opinion and urges mining men to watch their stock turnover, to protect the supplies on hand from depreciation, and to find out what their excess stock losses are. It is sound counsel.

### West Virginia and New York

**A**N ATTRACTIVE little booklet, excellent propaganda, favorable and unfavorable, truthful yet not recriminative, broad minded and convincing, has been written by Phil M. Conley, managing director of the American Constitutional Association, Charleston, W. Va., an organization on which serves Governor E. F. Morgan and I. C. White, the well known geologist of Morgantown, W. Va., and several representative citizens of West Virginia towns. The book is entitled "Life in a West Virginia Coal Field," and it studies conditions in fifty-eight Kanawha and Coal River villages.

Reading it, one feels disposed to wonder if the people of New York do not need some counter propaganda to spread about the valleys of the Kanawha and Coal River. So much has been written about its bandits, its robberies, murders and arson, its night life, tango lizards and giddy whirl of fashion, its mayors and aldermen, the high death rate on the city streets, the squalor of its tenements, its cold-blooded capitalists and its bucket shops, its missing children, its loveless homes and its divorces, its illicit bars and its dope fiends, its crowded schools and its not-too-clean politics, that it also needs a vindicator.

It surely needs to convince the inhabitants from Charleston to Thurmond and to Raleigh and beyond that the people of New York really are home-loving, industrious and dependable, with self-respecting homes, a happy, kindly even religious folk, the kind of men and women whom to know is to like, whom to meet is to trust. They need to undo the work of the moving-picture houses and the press, which takes almost pornographic delight in ferreting out evil rather than virtue.

We propose therefore that the American Constitutional Association survey New York also and deliver for the denizens of that city that same unvarnished tale that they have written of the coal fields contiguous to Charleston. For New Yorkers also are traduced and misunderstood. Their evil all report, their good qualities few recall.

Yes, they need Phil Conley to come to their rescue and let the world know that after all is said New York City is as good as Kanawha, Fayette, Boone, Raleigh, Logan and Putnam counties in West Virginia and that having a larger and so a more adequate police force it has a better, if indeed not any too complete, a hold over its small but active criminal population.





Rotherham Rescue Station, Rotherham, England.

### Coal Mining Institute Seeks

## Cure for Frequently Recurrent Mine Explosions

Ryan Gives an Account of His European Trip—Ashley Seeks Simplification of Coal Standards and Holbrook a Standardization of Mining Equipment—Chester Describes Air-Conditioning Apparatus

**S**HOT through and through in every part of the sessions of the Coal Mining Institute of America in its meeting of Dec. 19-21 in Pittsburgh and vicinity was the thought of safety provisions against the recurrence of the many mine explosions which recently have caused a large loss of life. The study concluded with a visit to the U. S. Bureau of Mines' Experimental Mine, where a test explosion gave once again conclusive evidence of the dangers of coal dust.

Alterations to the auditorium of the Chamber of Commerce Building, in the downtown section of Pittsburgh, which for several years has been the meeting place of the Coal Mining Institute of America, shifted this year's sessions to the lecture hall in the building of the U. S. Bureau of Mines. On the first day about 100 men attended the morning session and 250 men the afternoon session. H. D. ("Joe") Mason, secretary and treasurer, reported that the institute has been swelled to an enrollment of 2,631 members by the addition of 543 new members, 180 of whom were obtained by President Richard Maize. He reported that the bank balance was \$2,139.78 including \$1,000 in Liberty bonds. The total expenditure during the year was \$5,112.03. The tellers declared that M. D. Cooper was elected president and Nicholas Evans, Richard Maize and Dr. E. A. Holbrook were elected vice-presidents for 1924. The vote also showed that H. D. Mason had been elected secretary-treasurer.

After a brief address from the president, Richard Maize, in which he gave his ideas as to "What is the matter with the coal business," Dr. George H. Ashley, state geologist, of Harrisburg, Pa., delivered an address on "A Practical Classification for the World's Coals,"

in which he assumed 7 per cent as the normal ash and divided the coals according to their percentages of fixed carbon, equating those portions of the coal which were not ash to 93 per cent. He classifies the coals according to their carbon content, each class covering a variation of 7 per cent in that content. Thus midvolite was 63 per cent of carbon, and the classes above and below are lovolite, with 70 per cent of carbon, and hivolite, with 56 per cent.

The various classes of coal according to Mr. Ashley are anthracite, semi-anthracite, loorvalite, lovalite, midvolite, hivolite, hiervolite, moistvolite, himoistite and lignite. A committee was appointed to confer with Mr. Ashley relative to the preparation of a coal classification, the membership of which is as follows: A. C. Fieldner, U. S. Bureau of Mines; W. E. Fohl, consulting engineer; A. R. Pollock, general manager, Ford Collieries Co.; E. A. Holbrook, dean, School of Mines, State College, Pa.; F. B. Lockhart, coal broker, and J. J. Rutledge, chief mining engineer, Maryland Bureau of Mines.

In the discussion Dr. Ashley was asked if analyses could be used to identify seams and he replied most unqualifiedly "No," because the analysis of any seam varies greatly from place to place. W. L. Affelder asked why the coal in the upper part of the Pittsburgh seam is higher in sulphur than in the lower part. Dr. Ashley said he believed the cause of the phenomenon is leaching.

In answer to a question by W. E. Fohl as to whether coal can be classified as to caking qualities he said that actual test was required to determine that property. Dr. Fieldner approved of the simplicity of Dr. Ashley's

classification, as no figuring was needed in making use of it. He asked if the moisture content taken is that found in the coal when received, Mr. Ashley replying that for court cases it would be necessary to establish some standard specific method of determining the moisture content of the coal.

The first query in the question box was, "Does dynamite exert a greater force downward or does it exert the same force equally in all directions?" It was quickly answered, Jesse K. Johnson, of Bolívar, Pa., leading the discussion.

W. L. Affelder asked if tests have been made to determine the relative directions of force. C. S. Jones answered that dynamite in exploding acts equally in all directions. J. E. Crawshaw, of the U. S. Bureau of Mines, referred to Dr. Monroe's tests in which blocks of compressed guncotton were detonated on and under iron plates. The same results were obtained in either case. Dynamite produced the same relative effect in blocks of lead regardless of its position with respect to the sides of the cube.

Dr. E. A. Holbrook, of Pennsylvania State College, explained to the meeting the work of the American Engineering Standards Committee, formed in New York to standardize materials and practices (1) in general engineering, (2) at sea and (3) in the mines. He said that the national engineering societies are behind the move. The purpose of his committee is to study and formulate rules for explosives, underground electrical systems, safety lamps, etc.

As chairman of the committee on the correlation of mining materials and practices, he invited the institute to appoint a committee of two to work with his committee. Its main aim is to set standards of safety. The committee appointed consisted of Thomas A. Mather, state mine inspector of Tyrone, Pa., and Rush N. Hosler, superintendent, Pennsylvania Rating Bureau, of Harrisburg, Pa., with Dr. E. A. Holbrook as chairman.

J. T. Ryan then read his paper on "Some Observations on Mining in Europe," using about a hundred

lantern slides. He laid much stress on the safety methods of Europe, especially in regard to the avoidance of coal-dust explosions. He said:

"One of the outstanding safety measures in Great Britain and France is corrective of the hazard of coal-dust explosions. This subject has been given much attention and study by their technical and research men. Their investigations have determined that it is impossible and impractical under their conditions to render coal dust inert by wetting, and these conclusions were the basis of general regulations effective July, 1920, in Great Britain, which are as follows:

"(a) That the roof, floor and sides of the roadways, to within 10 yd. of the working face in dry and dusty mines shall be treated with incombustible dust, so as to insure that, throughout, the mixture does not contain more than 50 per cent of combustible matter; or

(b) They shall be so treated with water as to assure the dust being always combined with 30 per cent, by weight, of water in an intimate admixture."

"Rapid compliance with the provision has been given and, in consequence, in many instances roads are being stone-dusted right up to the working face. In my opinion it will be impossible for an explosion, once initiated, to extend any great distance in any mine complying with this regulation. The mine inspectors check up the condition of the dust by taking samples from the roadways, which samples are then analyzed by the Mines Research Testing Station.

"In France, regulations are somewhat similar, except that the dust must contain 70 per cent of incombustible matter, as against 50 per cent in the British regulations.

"Our practice in this country at the present time has been to depend upon wetting or humidification. In Europe they do not think this is dependable enough. There is one good reason, however, why they cannot resort to humidification in many of their deep mines, and that is the temperature, for at the present time it is about at the limit in which men can work. The temperature in some of the mines runs from 75 to 85 deg., and if air that warm were highly humidified, it would be impossible for men to work in it.

"Another important safety precaution taken in those European countries is the almost exclusive use of closed lights. In Great Britain in 1922, with 921,737 men employed underground, there were in use 584,404 flame safety lamps, 294,593 electric hand lamps and about 2,000 electric cap lamps. The British were slow to take up the electric lamp, but they are now rapidly replacing the flame lamp, and the electric cap lamp is just beginning to come into favor, and Scotland is the country that is showing this sign of progress.

"Rescue apparatus and mine-rescue training is made compulsory by regulation in all of these European countries, and in Great Britain these regulations date back to 1913. Briefly, they require that all coal mines and all oil-shale mines shall have the protection of approved rescue apparatus and trained brigades. Each mine may have its own individual rescue station, the number of men to be trained being regulated by the number of employees, or a group of companies may combine to form a central rescue station, the requirements being that this station maintain a permanent rescue corps which will serve all mines within a radius of ten miles from the station. The central rescue station is popular and most of the mines operate under such protection."

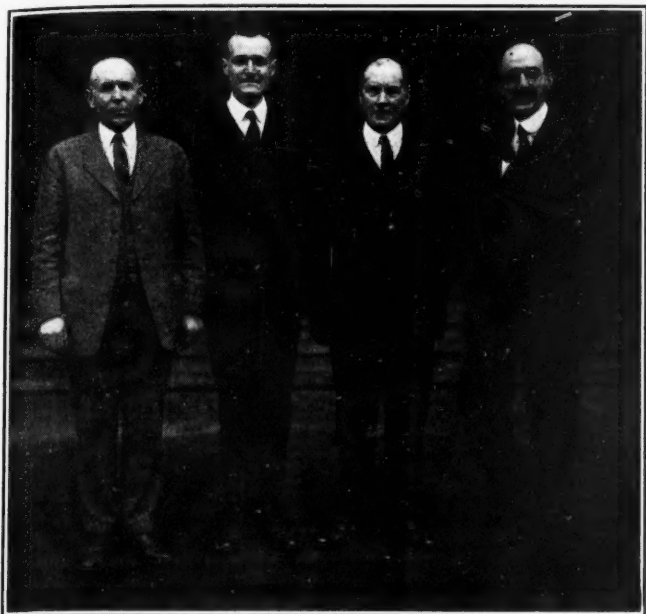
In the discussion of the paper Mr. Ryan was asked



JOHN T. RYAN

Mr. Ryan came back from Europe convinced that that continent was on the right track in advocating and enforcing the stone-dusting of mine entries.





COAL MINING INSTITUTE OFFICIALS, 1924

From left to right—Richard Maize, president, 1923; vice-president, 1924; M. D. Cooper, president; Nicholas Evans and E. A. Holbrook, vice-presidents.

if rock dusting could be used to advantage in the United States as it is in Europe. Mr. Ryan replied, "Absolutely." He said that the argument for stone dusting was well exemplified by the conditions at the mines of a company in an arid region of this country. There a complicated humidification system had been installed which will cost 29c. per ton of coal mined. Rock dusting would not cost more than 5c. per ton.

Question 2, "Which type of safety lamp wick gives a flame that is the more sensitive to gas—the flat or the round wick?" being presented, J. W. Paul, of the U. S. Bureau of Mines, remarked that with 2½ per cent of gas the round wick and with 3 to 4 per cent the flat wick gave the better showing. At low percentages there was no difference.

Question 3, "Is radio proving of any practical use in coal mining or for mine rescue work?" was answered by J. Jackowsky, of the U. S. Bureau of Mines. Mr. Jackowsky said that the telephone was a satisfactory way of transmitting messages except after an explosion, and it was hoped that radio might be developed to serve in its place under these conditions, but practically none of the present apparatus is sufficiently moisture- and water-proof for continuous exposure to the mine atmosphere.

A radio receiving set that had been left underground for about six hours became exceedingly inefficient. The Bureau of Mines has been using (1) ground-conduction methods; (2) induction signaling of both high and low frequencies; (3) wired radio over underground power and telephone lines, trolley wires, rails and pipes; (4) radio; and (5) electrical geophone and auxiliary signal equipment. In Mr. Jackowsky's opinion wired radio utilizing compressed-air or water piping, car rails, etc., as the conducting media is to be preferred. Dirt and water over these conductors and numerous breaks on the metallic circuit do not prevent the transmission of signals.

At the banquet in the evening speeches were made by Dr. Daniel L. Marsh, Captain Irving O'Hay and a comedian representing himself as the Hon. Abe Potash, a coal operator of Brunswick, N. J. The addresses were

unusually notable, Captain O'Hay especially ingratiating himself with his audience.

At the morning session of Dec. 20 W. E. Fohl, as chairman, opened up the meeting with a discussion of question 4, "What precautions should be taken in the installation of an electrically driven exhaust fan at a mine giving off methane, to prevent the gas in the return air from becoming ignited by the motor when re-establishing ventilation after the fan has been stopped for a sufficient time to allow the mine to fill up with gas?" The report of this important and lengthy discussion will appear in next week's issue.

The next question was: "What is the practical limit to the splitting of air currents?" D. N. Hubbell, mining instructor, said that the splitting should be done so as to supply at least the legal quantity of air to each split but also so as to afford each split enough air to prevent harmful accumulations of deleterious gases. Within these limitations he would advise as much splitting as possible, as splitting reduced the resistance of the air.

The sixth question was: "What changes in roof, bottom and coal are met when approaching a fault?" Joseph Williams, state inspector at Altoona, Pa., said that petrified wood often was found when approaching faults in the First Coal Basin and Dr. Thiessen requested that such finds be sent to him. Much petrified wood is found in Europe but in the United States such material was unusual. He would be much pleased to have an opportunity to examine it. Mr. Williams was of the opinion that the wood was of a date much more recent than the coal which was faulted.

Speaking of "faults" of erosion, or wants, R. D. Hall said that as they were excavated in the seam they often were accompanied by drift matter which had lodged as drift wood even now does at the bank of a stream. This drift has later been filled with shales or sands and as a result the coal is covered by material filled with vegetable matter. This material gave a most uncertain roof and he recalled a man being killed in a heading purposely driven narrow toward a want. The material which fell was full of the imprints of ferns. He had noted that as a rule in a certain want the ferns lay, not as they had fallen, with the maximum diameters in all directions, but as they had been rearranged by the stream, with their major axes in the direction of stream flow.

He added that at this particular want the coal at one place suddenly thickened from 3 to 6 ft., as if the bed of peat had been torn away bodily and dislodged, landing entire on the top of another area of eroded peat. Without attempting any accuracy he thought the area of the displaced and deposited peat block would cover roughly an acre.

Joseph J. Walsh, Secretary of Mines, State of Pennsylvania, then addressed the institute on "Mine Fires and Some Methods of Extinguishing Them." He advocated the use of flue gas as cooled in a tubular cooler and then sprayed by falling water. He said the



W. E. FOHL  
Consulting mining engineer,  
Pittsburgh, Pa.

purpose was to supply so much incombustible gas that no air could enter the fire area. He believed this to be possible if the right precautions were taken to close in all openings as far as could be arranged. He advocated closing the return first and never the intake. He said that there had been twenty - seven coal crop fires

in the anthracite regions; one was sixty years old, one twenty years. However old they might be, none of them had hitherto been extinguished and many means had been tried in every instance—flooding, direct fighting and sealing. One mine was sealed for eighteen years and no sign of any fire remained till an attempt was made once again to enter the fire area. The fire that had slumbered for years then awoke again and soon raged as menacingly as ever. He declared that, with 100 per cent excess air in the furnace, flue gas containing 5 per cent of oxygen could be generated, and in such an atmosphere no fire would continue to burn.

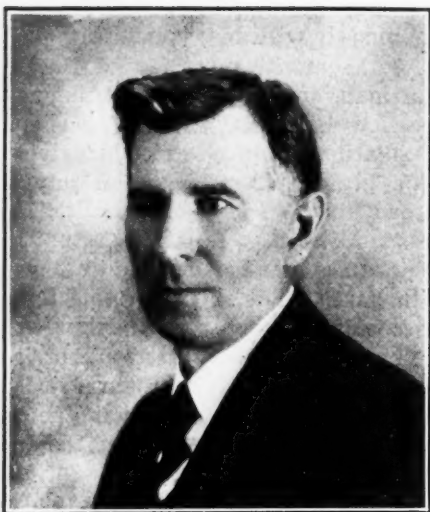
In the afternoon session of Dec. 20, Thomas Chester, Mining Engineer, American Blower Co., Detroit, Mich., read a paper entitled "New Data Concerning the Humidification of Mine Air," in which he described the Lide method of conditioning air and driving the air thus treated by an auxiliary fan into the intake entry fan drift would have to be concrete.

The conditioned air is at the temperature of the mine and fully saturated at that temperature. Mr. Chester said that the conditioning of air had been proved possible in the manufacture of matches, where the heads were dried in a factory the air of which had been conditioned. It had also been used in motion-picture film factories.

Questioned as to the cost, he said that an installation to condition 100,000 cu.ft. of air per minute would cost, including the fan but exclusive of the second drift opening, about \$3,000. The operating charge would be equivalent to the cost of about 0.6 ton of coal per hour plus the labor involved, which would be small. In addition there would be the power involved in driving a 10-hp. motor, which would be ample, as the water gage needed to drive the air through the conditioning apparatus would be about  $\frac{1}{2}$  in.

Mr. Chester said that stone dusting the entries would not solve the problem of making a mine safe, for the fine dust tended to settle not in the main entries but rather in places where the current was relatively sluggish. The high-speed currents dried the mine and also carried the dust. Thus in the more quiet places the finest and most dangerous dust was constantly being deposited.

Asked whether it would be necessary to concrete the fan drift he replied that no great heat was required at



JOSEPH J. WALSH  
Secretary of Mines, State of Pennsylvania; advocate of flue gas for extinguishing mine fires.

any place and consequently the natural strata did not tend to disintegrate. For this reason no part of the fan drift would have to be concreted.

He also said there would be no fog if the temperature of the conditioned area was kept continuously at 60 deg., for it would then be at the temperature of the mine itself. This would not wet down the mine, for the air would never be supersaturated, but it would prevent the mine once wetted down and containing natural moisture from drying out.

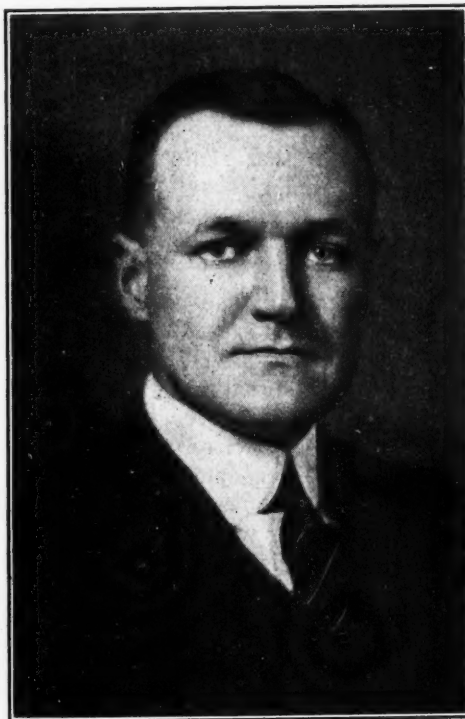
Should the pressure of the fan of the conditioning apparatus be made high enough to compel the air to leave by the portal of the mine, this air, being cooled in winter by the outside air, would cause a fog at the drift or shaft mouth. The same fog would be caused there as at the chimney of the main fan, but as it would be a surface fog it would not occasion inconvenience.

He declared that when no men were in the mine the air could be conditioned to a temperature of 75 deg. In that case a fog would be formed, as the mine would not sustain such a temperature. Under these circumstances the mine would become wet with water dripping from the air. It might be well to condition the air at this higher temperature out of working hours.

J. W. Paul said that the injury to the roof by the crude methods of moistening usually adopted was due not so much to the heat as to the changes in temperature, which caused the roof at one time to expand and at another time to contract.

He added that even where the air was incompletely saturated it had been found that droppers and globules of water appeared in the roof. These globules were frequently ascribed to water deposited by condensation, but he believed that in most cases, as the air was not saturated, they came from the moisture of the workings themselves. Edward Steidle believed that rock dusting might profitably be used in connection with some such process of air conditioning as Mr. Chester had described.

Under the leadership of Nicholas Evans, state mine



M. D. COOPER  
Newly elected president of the institute; assistant general superintendent, Hillman Coal and Coke Co.



inspector, of Johnstown, Pa., three questions were considered. The first of these was: "Where does the most dangerous dust lie—on floor, ribs or timbers?"

One of the members connected with the Keystone Coal Co. said that he had sprinkled his roadways day and night and still they were not as damp as he would wish. He thought the haulageway dust the most menacing of any. R. E. Kirk said that since the Gates disaster the H. C. Frick Coke Co. had classified its mines into dusty and non-dusty mines, and in the former allowed no shooting off the solid and required that the room be sprinkled before cutting, before shooting and after shooting.

J. O. Durkee said that at the mines of the Bethlehem Steel Co. the dust at the face was the cause of the greatest apprehension. Water cars and the sprinkling of coal cars took good care of the haulageways, but the rooms were kept free from dry and dangerous dust only with difficulty. In many of these, pipes had been carried to the working faces, and as a result the officials at the mine were able to keep the dust wet.

Someone from the Oak Creek Mine, Routt County, Colorado, described the conditions at that mine, where the men could not see one another's light across a 40-ft. face. Now by the use of a sprinkling line on the cutter bar the dust is satisfactorily wet down so that it is no longer dangerous.

Nicholas Evans much regretted that any one should have invented the use of the word "sprinkling" because "drowning" the dust was what was intended. Mr. Paul said that as the finer dust was the more sensitive to explosion it was the kind most to be feared. It lodged in gobs and on timbers and was exceedingly dangerous.

The dust on the lower half of the mine rib in steep and mule-haulage roads and especially on those that were wet was relatively harmless. In fact in some mines the ribs are splashed with mud for some distance from the floor. It must be remembered that two one-hundredths of an ounce of coal dust per cubic foot of entry will be enough to make an explosive mixture of coal dust and air. This much dust would just cover a silver quarter.

The British requirement of 30 per cent of water in a place which did not have to be sprinkled was a requirement with which few sections of any mine could comply. All the recent explosions in Great Britain have been in damp places, and these have been stopped only where shale dust areas have been reached.

Question 9: "What are the most common causes of the ignition of gas in coal mines?" was answered by



THOMAS CHESTER

Advocated that the air entering the mine be conditioned as to moisture and temperature so that it would keep the mine wet yet free from fog.

that was ignited by safety lamps which were either defective or unlocked, and 400 by ignitions of gas or dust by electric arcs. Two hundred men had been killed by explosions due to ignition of gas by men who were smoking or preparing to smoke. He said that all open lights should be abolished.

A spirited discussion arose as to Question 10: "How tight should posts be set in rooms and entries?" Crawford Wilson remarked that the height of the seam, the nature of the overburden and the pitch had much to do with the problem. He believed that props should not be set too tight but certainly should be set sufficiently snug that they would not be knocked out.

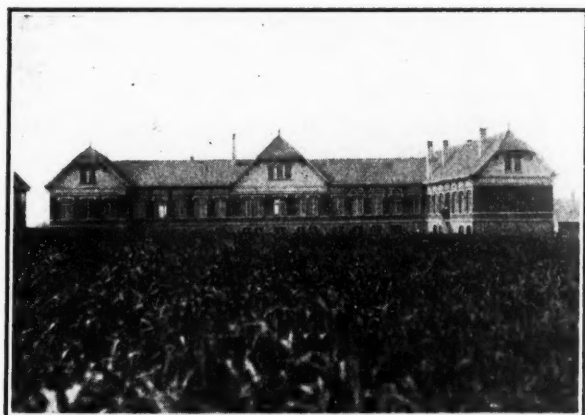
Edward E. Girod, state inspector, of Masontown, Pa., remarked that some persons put in props so tight that they were almost broken by the strain of setting. Some men put up a prop and fail to make it tight, expecting later to wedge it tight or hoping it will get tight later. That also is wrong, as someone or something may cause it to fall, with consequent injury.

Still it is dangerous to prop a roof that has sagged or drawn, so as to lift the rock. The strain of forcing the rock back into place may cause it to break. It would be more permissible to post solid rock tightly. He recalls a case where a foreman was extending a side-track and making the roadway wide for that purpose.

The foreman put a row of extremely tight posts up the center of the roadway. Mr. Girod warned him of the consequences. Some time after about 180 carloads of rock were removed and about 200 more were lying in the roadway. The props had broken the drawslate.

About 200 members attended the demonstration of Dec. 21 at the U. S. Bureau of Mines' Experimental Mine, Bruceton, Pa. An explosion of dust from the West Kentucky Coal Co.'s No. 9 mine was successfully produced by a blown-out shot in which 4 lb. of black powder was used. The tunnel was provided with 1 lb. of the dust described per lineal foot of entry, 20 per cent of the dust passing a 200-mesh screen. The flame shot 400 ft. beyond the dust bed, but was stopped by a Rice barrier. No gas was present to aid ignition.

A test was made to show that permissible explosives used in proper quantity will not ignite dust. Powder was tested also with the ballistic pendulum. Another test showed how a keg of black powder could be ignited by contact with electricity, and another exhibited the fact that coal dust blown into the air may be ignited by an ordinary flame.



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A station that would cost in America about \$300,000.

## It Is Easy to Waste Money on Mine Supplies

Buying More Stock Than Is Needed and Allowing It to Depreciate on Hand a Costly Leak in Many Organizations—Computing That Cost a Little-Known Science But Worthy of Close Attention

BY NEILL HUTCHINGS  
Birmingham, Ala.

**W**HAT is the cost of carrying a stock of supplies at a coal mine? And, more important, what is the cost of carrying too much of such stock?

Here is one of the important cost elements of business, yet it is a little-known element because it is rather intangible and difficult to put into figures. Many a wide-

awake mine manager gets a more or less definite idea of whether he has on hand too many machine parts, too much wire rope and the like, by watching turnover. But even a live manager may not realize how much the company suffers by losing the working value of dollars expended for dead material. Nobody has worked out an exact system for him to follow, but it is worth while for every mining company to

study the matter. An illuminating statement on this subject was made recently by a man who since the close of the war has engaged in reducing and liquidating the inventories of one of the largest concerns in our country. He says the cost of carrying money in excess and undesirable stores and supplies rather than in active business amounts to as much as 3 per cent per month! This is 36 per cent a year and means that for every dollar's worth of supplies bought and kept for a year, 36c. is lost. For every \$100 worth the loss is \$36; for every \$1,000 worth, \$360, and so on. This cost is made up of such factors as the earning power of a dollar actively employed in the business, losses from depreciation, obsolescence, shrinkage, expense of handling, caretaking, watching, renting, accounting. In addition, there is the cost of added storage room for surplus material and the waste in use which naturally comes from having plenty to draw on, thus dulling the exercise of economical use of supplies and materials.

This man probably has come very close to computing the cost of carrying dead stock. If he has, then no doubt many concerns are losing big money. For an inventory devoid of surplus, obsolete or excess material is hard to find nowadays.

There are two schools of thought regarding the charging of supplies and materials to mine costs. One, which is the older method, is to charge cost with materials as they are purchased. In this plan there is no inventory of stock on hand. Everything is charged out. Many of the older men in the mining game remember when this plan was general. A man thought twice before he signed an order for a carload of costly supplies. He knew his cost would have to stand it. This was the plan's best feature, for the cost sheet of

a coal mine is its manager's pocketbook. He wouldn't buy until he had to.

But it had many objectionable features. One month's cost was charged with materials used in later months. Such a plan destroyed comparative cost value. It really meant that only yearly costs reflected facts. A man

could not tell what his cost would be from month to month and so he never knew exactly the relation of his income to outgo for any given month.

This older plan has been supplanted by a generally modern one founded on the principle that monthly cost should be charged only with materials actually consumed and used in that month. It is the better plan of the two. Still its practice value has certainly been less-

ened by the fact that mine managers who always pay chief attention to the cost sheet have paid too little heed to the volume of cash tied up in stock.

This modern plan requires a stock inventory. It has been, and always will be, the most natural thing in the world for the operator of a mine to insist that his storekeeper keep on hand all the things the mine will need, not only for current operations but for every conceivable emergency. He feels about his storehouse stock like the man in Texas used to feel about his gun. He did not need it often, but when he did need it he needed it bad. So under this method stocks grow. Instead of ordering one or two pieces of repair parts the buyer orders a half dozen. Maybe they come a little cheaper that way. Instead of one month's supply the storekeeper is told he had better order two, the excuse being "We will use it anyway and you'd better keep plenty on hand." This plan as a rule soon accumulates some excess, surplus, semi-obsolete and even worthless stock on hand.

Yet this plan is right. Cost should be charged only with the materials used in each cost period. It is the correct principle. But it does mean eternal vigilance over plant requirements carried in inventory. What is really needed to make the plan more nearly perfect is a definite system of ascertaining the cost of carrying stock.

Calculating turnover is a good way of getting at stock carrying costs but this process involves innumerable factors, such as proximity to market, seasonal requirements and variations in market prices as affecting purchases; so turnover is, after all, only a rough guide.

Applied common sense is the essential thing. By this is meant the use of common sense to determine how

### FIND OUT

Does your mining company lose \$360 every year on every \$1,000 invested in mine supplies in stock? In this article an authority is quoted by Mr. Hutchings as saying that this astonishing rate of loss is suffered by many a concern. The fact that few mine managers know what their dead-stock losses are is reason enough to convince them that they should *find out*. There are suggestions here to guide them.



much stock of this and that shall be carried. Somewhere in every mining concern big enough there is a man with this kind of sense. Applied common sense simply means putting him at work on the problem. He is the fellow who sooner or later will prove what a dollar invested in dead stock costs. This fellow will show how poor a guide turnover is, by proving that in a majority of stocks 75 per cent of disbursement value is for material representing less than 25 per cent of total stock. He will do more than that. He will search out the excess and surplus and scrap it or sell it. By hard work he will determine, item by item, the lowest possible limit to carry without hurting operations. That really will be the cream of his work, for it is the only practical thing to do.

An operator can not set an average cost for the stock as a whole. His "common-sense man" will eventually keep him from buying excess supplies. That man will soon be authorized to O.K. all purchasing orders, both to see what he can do in the way of substitution for materials already bought and to buy less than somebody has ordered. He won't let the company buy anything that *might* be needed. The cost of this is too high. It is too much like letting a man name his own salary regardless of his ability.

The cost of carrying surplus supplies is an intangible thing and probably it is not a definite cost figure. Even if we assume 3 per cent a month to be entirely too high and call it 2 per cent a month, some very interesting calculations can be made. For example, suppose a mine concern has a total inventory of supplies of \$500,000. Assume further that the excess stock—i.e., supplies bought and on hand in advance of actual need—is \$50,000. Then it follows that the monthly cost of having this surplus stock is \$1,000.

Carry this thought further along and think of two concerns having this same amount of surplus stock. They begin to liquidate it at an even rate. The one that can get rid of it in six months while the other takes twelve will save \$6,000 more than the latter. This is the earning power of the money released by this process.

#### ALL LIKE TO PICK NEW "STUFF"

In connection with this thing of too generous buying, carrying surplus supplies and suffering actual monetary loss as a consequence, it is not surprising that American industry, like present-day individuals, has wandered far afield from old-fashioned thrift and saving principles. It is not an uncommon thing to find even at the most modern mining plants a lack of care in providing proper storage facilities for supplies. Costly wire rope sometimes is exposed to weather until some of the strands have rusted through. Iron and steel stock often is left exposed until rust has pitted and injured it so badly that it is useless. It is a natural instinct with all of us to like to use new and shiny material. Mine mechanics, electricians and blacksmiths will take the newer stuff every time if they can get it. It pays to keep material in attractive condition, lest it be left to spoil.

Another thing productive of considerable economy in the storing and handling of mine supplies is to concentrate. Don't permit supplies to be scattered all over the mine plant. Put them in one place, as much as possible inside a central storehouse building, and the rest under fence right around it. To permit materials to be unloaded and stored just anywhere that happens to be convenient is to deliberately invite loss. The stock

is likely to be used indiscriminately, stolen or allowed to suffer by reason of neglect.

Protect heavy supplies that must be kept in the open, from weather. Both sun and moisture are directly detrimental to certain materials. Light, for example, has a tendency to rot belting. Consider mine supplies as just another form of money and treat them as money.

Mine foremen, electricians, mechanics, blacksmiths, superintendents, managers, can do their concerns a lot of good by studying closely the care and use of mine supplies and materials. After all is said and done, they are the men who create stock, and if there is such a loss as 2 or 3 per cent a month on surplus and excess stores, they are the men responsible for it. Next time one of these men orders or draws a requisition, possibly he can do without something he is buying and cut down the order to fit immediate needs. It will reduce the stock-carrying loss and will increase the worth of that man to the concern and enhance his own self-respect. In fact, whenever a man learns to work for a concern and care for its dollar as much as he does for his own earnings, he has started on the trail that leads to his own individual success.

## Electric Signaling Devices

Mines Operated Electrically Must Adopt Electric Signals—Signals for Emergency and Time Calls

BY T. R. HAY

WITH the gradual passing of steam drives for machinery around the coal mines and the increased application of electricity to old and new fields there has arisen a necessity for some efficient type of signaling device for alarms or for other purposes.

The natural trend of development has been to electrically operated sound signaling, as such a device can be made automatic, may be installed in any location and operated with but a limited amount of attention.

The electric siren with its peculiar penetrating quality of tone gives a distinctive call for help—a fire emergency or danger signal—that is instantly recognized as such. Its very sound is a warning, a rallying call for assistance, because it is so different from all ordinary factory whistles, fire bells or other alarms. The application of an electric signal does not find itself limited to the field of emergency calls, but in many

places it is used to great advantage as a time signal.

At coal-mining operations a whistle may be used as a work signal, an emergency fire or accident signal, or for both. At many coal-mining operations the miners often live at a distance from the mine workings. Because of the distance element, there may



FIG. 1—SINGLE-HORN SIGNALING DEVICE

Some of these signals are made with two horns, one on each end of the drive shaft. The small sizes have one horn, and the largest sizes two horns, in this style of construction.

be more or less irregularity both in starting and quitting work, especially the former. With, say, 100 men employed, if an average of 50 per cent are tardy ten minutes each day in starting to work, 500 work minutes, or  $8\frac{1}{2}$  hours per day, are lost. This comes to something over 160 work hours per twenty-day month. In terms of tonnage lost due to tardy attendance, this means a considerable item over a long period. Punctual attendance is worth real money. In the winter period, when coal is in demand, when the price is relatively high, and when, on account of uncertain car supply, it is desirable to make maximum use of the hours when the mine does work, this matter of punctual attendance becomes more important than in the summer months, when demand and price are relatively low and car supply fairly dependable.

#### PROVIDE PROTECTION AGAINST WEATHER

The electric siren whistle consists of a small motor with the shaft extended on one or both ends, depending on whether it is of the single-head or the double-head type. A slotted aluminum rotor on this shaft extension revolves under a conical-shaped steel slotted "horn." The air is taken in at the ends, which are of cast iron, and the sound comes out on the periphery of the "horn." A sheet-steel cover, usually bolted to the horn or horns, protects the motor and bearings from rain or from any foreign material. The motor leads are brought out through this cover, which for one type at least is permanently fixed in position. Oil cups, located on the outside of the case have spring caps, thus making oiling convenient and at the same time protecting the bearings and keeping the oil free from water. The motor base

is substantially made and is of cast iron.

The siren commonly used about coal-mining operations is made in the single-head and double-head types. The single-head siren can be heard over a radius of approximately three-quarters of a mile. The double head siren, which is the one most commonly used, can be heard over a radius of a mile and a half to two miles. At many installations the siren can be heard a greater distance than stated above.

For best results the siren should be installed at least 40 to 50 ft. in the air and 10 to 15 ft. above any roof or other flat surface. It should

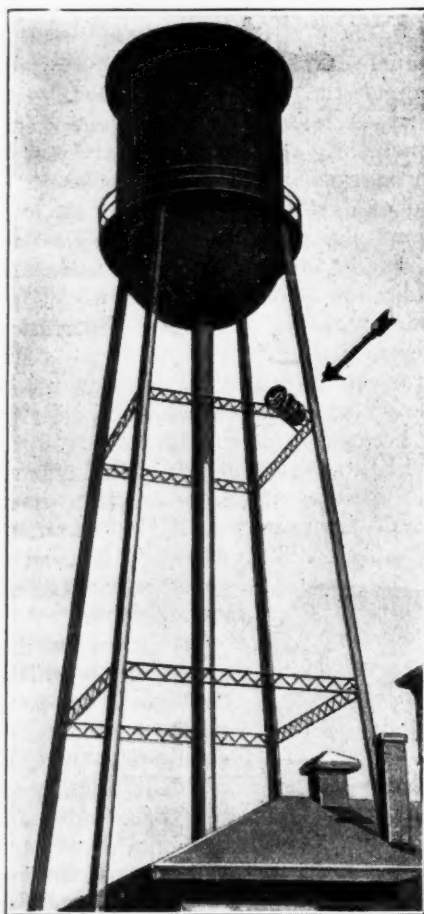


FIG. 2—SIGNAL IN POSITION

For long-distance service, it is important to mount signals well up in the air so that the sound waves will not be reflected by buildings or other structures.

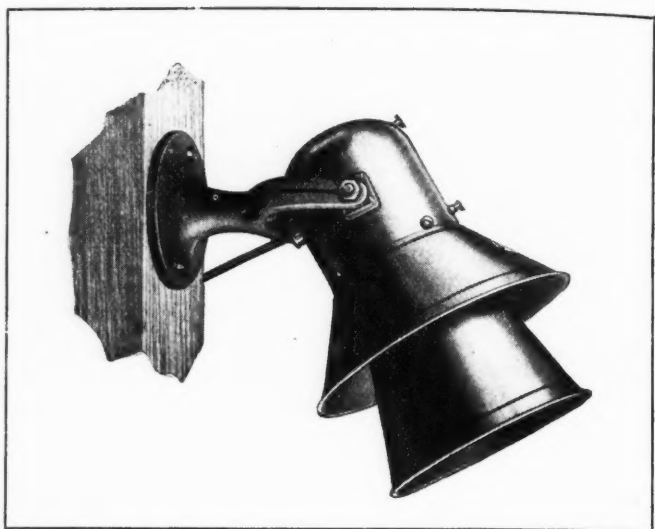


FIG. 3—A LOCAL SHORT-DISTANCE SIGNAL

Where the signal is to be used for short distances and yet be heard over the noise of running machinery, the above type frequently is used. Hoisting signals operated electrically give most satisfactory service at the coal mines.

be above near-by buildings or trees. The reason for such installation is because a roof or other flat surface directly below a siren acts as a sound-board and throws the sound waves up in the air instead of distributing them over an extended area. A good method of installing sirens is to set them on a crosspiece or tripod connecting the tops of two or more telegraph poles. The siren may be located on the top of a mine tippie, above the hoist sheave, or on a platform above a flat tippie or substation roof. The axis of the siren should be at right angles to the direction in which it is designed to distribute the sound. This is because, as previously explained, the air is taken in at the end through the cast-iron "horn" and the sound is forced out at right angles through the steel slotted portion of the "horn."

The siren may be operated by means of a knife switch located in the substation or at any convenient point. It also may be operated by means of a remote-control device, consisting of two or more "start" and "stop" momentary contact pushbutton switches, together with a magnetically operated circuit breaker. The use of this remote-control switch device enables the starting and stopping of the siren from more than one locality, such as the tippie, the substation, the superintendent's office or commissary.

The tone of the siren may be varied and a "wildcat" call obtained by manually opening and closing of the control knife switch. This "wildcat" call may be obtained automatically by using a motor-operated make-and-break switch. To get the proper effect, whether by hand or automatically, it is necessary to allow a sufficient time interval between the breaking and making of the motor circuit to enable the siren to slow down sufficiently to give a distinct tone difference.

The single-head siren weighs approximately 250 lb. and the double-head siren weighs approximately 350 to 400 lb. The siren is simple in design and construction and can be connected up without any special difficulty. All that is necessary is to install it on a secure base and connect the motor leads to the power supply. These sirens are supplied to operate on single phase, 110 or 220 volts, and polyphase, 110 to 550 volts. They can be used on either 25- or 60-cycle circuits.

Sirens also are furnished to operate on direct current



of any voltage, from 110 to 600 or 700. Operation on any phase a.c. or on d.c. at 220 volts or more is preferable because of lower starting current and better voltage regulation. The single-phase siren is equipped with a repulsion type motor with brushes; the polyphase siren is equipped with a squirrel-cage induction type motor; and the direct-current siren is equipped with a series-wound d.c. motor.

Coding or call signaling can be obtained with greater satisfaction with the polyphase a.c. motor or the d.c. motor than with the single-phase motor. The last-named type is not so satisfactory as the others because it is necessary for the brushes to lift from the commutator in order to obtain satisfactory tone effects. This requires that the siren slow down too much to give the desired results.

In addition to the single- and double-head siren discussed above, a small siren designed for local use, which can be installed indoors or outdoors, is manufactured. It is distinct in tone and because of its construction there are no parts to wear or get out of order. It has only two bearings, one at each end of the armature shaft with oil cups of sufficient capacity to require oiling only two or three times a year. The sound penetration is approximately 400 yd. and it is being used with success at many coal-mining operations where only local sound penetration is required.

## Ejected Cement Gives Life and Strength to Mine Structures

Stoppings Readily Constructed with Concrete Sprayed from Nozzle—Gunite Frequently Substituted for Concrete in Lining Shafts and Slopes

BY A. F. BROSKY

Assistant Editor, *Coal Age*, Pittsburgh, Pa.

**O**F RECENT years projected concrete has been extensively used in the building of stoppings for ventilation or for sealing abandoned workings. Of the many types of stoppings constructed with the use of this material perhaps the most common one is a pack wall of slate or sandstone laid without mortar and sealed by shooting it with gunite on one of its exposed faces. Care should be taken to form an airtight seal, especially around the outer edges of the stopping. This is accomplished by extending the coating material beyond the points of contact by shooting the liquid mass over the ribs and roof. In consequence no air can pass through the coal at the side of the stopping or through the roof at the top of it.

Permanent and airtight stoppings are built in the Tropic mine of the Tropic Mining Co. (Ohio) by fastening a reinforcing mesh on props wedged so as to stand vertically against either rib. Behind this mesh is placed tar paper, which serves as a backstop for the shooting of the gunite, which is projected to a thickness of 2 in. After standing five years these stoppings are as intact as the day they were erected wherever the roof has held up. Under weak roof it would seem that a thicker wall would be desirable. In that case an alternative method of construction may be utilized.

Stoppings are erected in the Wolf Summit mine by setting two prepared wooden forms at a distance apart equal to the thickness of the stopping desired, which usually is 8 in. The box thus formed is filled from the top with gravel. The nozzle of the gun is then inserted

downward from the top, and the gravel is impregnated with gunite. After this wall sets the forms are removed elsewhere and the openings at the joints are closed with gunite. This stopping can be erected in 45 minutes of actual working time after all the material is on the job. The completed stopping is shown in Fig. 1. A similar construction (Fig. 2) was utilized in adding a vertical section of 6 ft. to a curtain wall in the shaft of this mine, which was left open at the bottom during the early stages of development.

### SEAL OFF WATER AND GAS WITH GUNITE

Gunite also was used at this mine to form water dams and to seal off gas. Large quantities of this gas escaped from falls of rock, the roof breaking under the pressure of the gas pent up in feeders. The dams were placed at the dead ends of the two headings and were made 30 in. thick. They were built solid to the roof and ribs in the same manner as the stoppings already described. Behind these dams are water springs and also feeders of gas which showed 28 per cent of methane in tests made before the construction work was completed. This gas which repeatedly caused the limestone which is 15 ft. above the coal to break and fall was bled by boreholes drilled from the surface. The bottom is of soft clay overlaid with a harder material which leaks where broken. Consequently water seeped under the dam and through the fireclay and ran down the dip to lower workings. This seepage will be closed off by drilling vertical holes to a depth of 12 ft. and injecting gunite through them. The water accumulating behind the dams is piped to an open ditch.

Open ditches on the surface in hydraulic projects frequently are lined with gunite and this suggests another use for it underground. Where mine drainage on a large scale is accomplished by open ditches as it is in the mines of the Berwind-White Coal Mining Co., situated in the Wilmore Basin, at Windber, Pa., gunite, besides reducing the resistance to flow, would also facilitate the cleaning of the ditches.

### USE OF GUNITE IN SINKING MINE SHAFTS

Shafts sunk through self-supporting formations, which, however, disintegrate in time may be lined with gunite instead of concrete wherever the water problem is not serious enough to require sinking under pressure. The engineers of the Oliver Iron Mining Co., at Hibbing,



FIG. 1—GUNITE-GRAVEL STOPPING AT WOLF SUMMIT

The stopping was made by erecting two forms and filling the intervening space with gravel, which was then grouted with the cement gun. The forms were removed after the mixture had set, and gunite was then placed on the exposed face, making a strong, tight and permanent stopping.

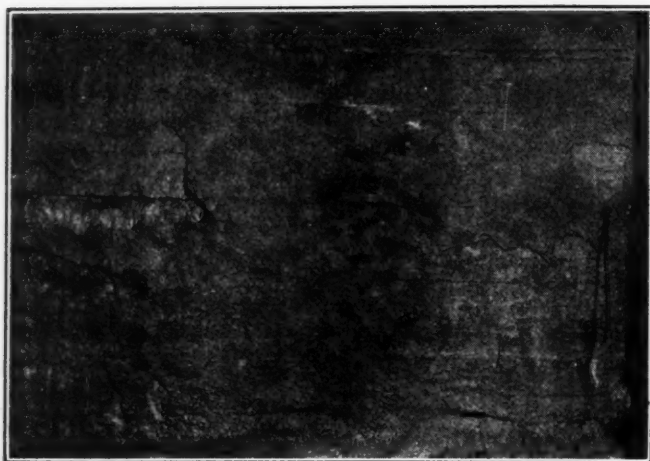


FIG. 2—CURTAIN WALL AT WOLF SUMMIT GUNITED  
This wall is located at the foot of the shaft. One advantage of gunite is the ability to seal the edges and corners of the stopping where small leakages with other forms of bratticing allow much air to pass, especially where the water gage is at a maximum, as in this instance.

Minn., closely watched the action of gunite in preventing disintegration of such formation, and the results were so favorable that they are using it in sinking a shaft which will be lined by this method.

A reinforcing mesh is attached to expansion bolts placed on 30-in. centers on the face of the rock. Upon this approximately 2 in. of gunite is placed. This thickness is attained in two layers, the first being just sufficiently thick to come out to the mesh and the second being  $\frac{3}{4}$  in. thick; thus the mesh is everywhere covered with at least  $\frac{3}{4}$  in. of gunite. The first coating is allowed to set for several hours; it is then wetted down and the second coating applied.

When water occurs in the form of tiny streams or of thin films covering the surface of the rock it prevents the gunite from adhering. However, the small streams of water can be led to weep pipes and the gunite can be applied by coating the points away from the pipes first and then extending the coat toward them. Gunite can be applied successfully to a very wet surface by using a solution of sodium silicate (water glass) instead of water as hydrating agent.

#### ELIMINATES NECESSITY FOR TIMBER RINGS

To attach the guides, holes are drilled in the rock and in these expansion bolts are placed and grouted. Around these are built pads of gunite projecting sufficiently to act as seats for the base of the guide blocks. This provision eliminates the necessity of using timber rings around the walls of the shaft. Wooden buntons are placed across the shaft. These are attached to reinforced corbels built out with gunite from the sides of the shaft.

The cost of this lining is about 20c. per square foot not including the overhead. The cost of doing a similar job may be roughly estimated by bearing in mind that one bag of cement and 3 cu.ft. of sand will cover 11 sq.ft. to a thickness of 2 in.; that a crew consisting of a nozzleman and his helper, a gun operator and four laborers can apply each day at least 800 sq.ft. of gunite to a thickness of 2 in.; that the cost of drilling holes for bolts is approximately 5c. each; and, finally, that American Steel & Wire triangular mesh No. 068, or its equivalent, will cost about 4c. per square foot in place.

In many cases gunite may be substituted for concrete

in the lining of slopes. The extent to which it may be used on any one job depends upon the depth of the seam of coal below the surface and the nature of the overburden penetrated. Where a slope will stay open of its own accord, as in penetrating thick beds of clay and soft shales, obviously a concrete lining poured into forms must be used, as otherwise the requisite strength will not be attained, but where self-supporting shales and sandstones subject to weathering are penetrated, a gunite lining is used advantageously.

#### SLOPE HAS 1,200 FT. LINING

In 1918 the slope of the Wilson Mine, owned by the Acme Coal & Coke Co., was lined with gunite for a distance of 1,200 ft. It lies in rock which is subject to weathering when exposed to the air. This is especially true of such beds of fireclay as the slope penetrated. So far the lining has shown no signs of failure, which is a reasonable assurance that the work is permanent.

A more recent job of the same kind was done in the supply and manway slope of the Gibson Mine of the Hillman Gas Coal Co., at Weaver, Pa. For a distance of 550 ft. it was lined with concrete, the remaining distance of 200 ft. to the bottom being left unlined because the rock appeared to have sufficient strength. It was attacked by the air, however, and commenced to flake. The problem was solved by cementing the roof and sides with gunite.

Slopes driven through country rock to flat beds of coal expose successively the various bedding planes. Cracks develop at such points, and the weathering action is accelerated. The disintegration is more rapid in this case than where the slope parallels the bedding planes of the rocks, as in a synclinal basin. Consequently, in driving a slope under such conditions the gunite lining should be kept close to the face.

#### POSSIBILITIES IN CONSTRUCTION WORK

Gunite can be used in many places in underground construction and about the surface plant. Sumps already are being lined with gunite where the bottom is soft (see *Coal Age*, April 19, 1923). Overcasts if not built with gunite may be sealed with it where leaks develop. Disintegrated concrete linings in shafts have been successfully resurfaced with it wherever properly applied to a reinforcing mesh, which is used more to bind the coating than to give it strength.

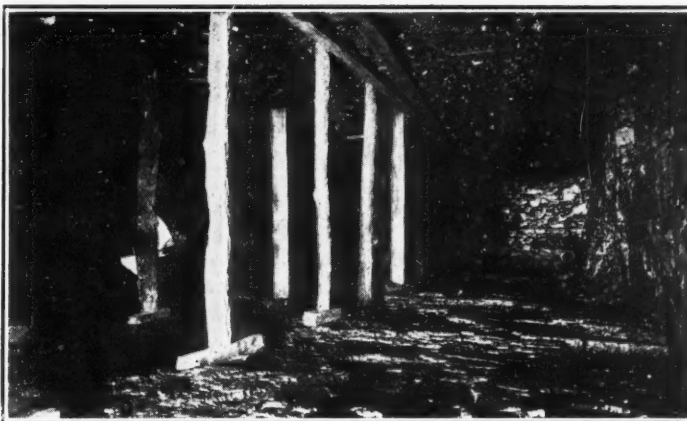
An important use has been found for gunite in fire-proofing small supply rooms, motor barns, pumprooms and other permanent underground stations in the coal. Open walls may be built to close in these stations by processes described in the construction of stoppings. On the surface the exteriors of wooden plant buildings and miners' dwellings may be plastered with gunite providing these are backed with a reinforcing mesh.

Where steel trestles are erected in a coal-storage yard, whether at the mine or at an industrial plant, the lower portions of the piers, which are likely to be buried in the coal, may be protected from abrasion and subsequent rusting by a coating of gunite. It is needless to state that moist coal with a high sulphur content will attack any steel structure that may come in contact with it. Paint offers little protection, as it is soon worn off. At Beach Bottoms, W. Va., the steel work in the yard in which was stored coal coming from a mine adjoining the Windsor central station of the West Penn Power Co. was gunited and in this way protected from abrasion and corrosion.



## How Many Cars Should We Employ in Mines?

Number Is Based On Tipple Capacity, and Rightly, Because, If That Figure Is Exceeded, Cars Cannot Be Moved



**I**N DEVELOPING and operating a mine how many cars should be provided? The number of mine cars in actual use in a number of the mines visited is given in Table I. Though the number of cars at any of these mines is not by any means proportional to the capacity of the mine to produce coal, the variations, as shown, are evidently extreme.

As a matter of fact, the determination of the correct number of mine cars that should be available at any particular mine to transport the coal from the face to the tipple has been given extraordinarily small consideration from an engineering standpoint. It was with the greatest difficulty that the officials of most of the mines visited could be induced to discuss or explain in concrete figures the method by which they determined the proper number of mine cars for their own particular mine.

The problem of the proper number of mine cars may be viewed from two opposing points of view. The miner is primarily interested in having enough cars to furnish him with sufficient empties to avoid lost time. The management is primarily interested in enough cars to provide coal for a continuous operation of the tipple. The number of cars necessary for an adequate supply from the miner's viewpoint, when the mine is operating at capacity and under the present condition of understandardized operation, always is larger than the number necessary to produce continuous operation of the tipple.

Because of these facts, the management in most cases is largely governed by the rule of thumb that if, with plenty of labor and barring exceptional accidents, there are tipple delays due to "no loads," buy more cars, but if the tipple continues to operate steadily there are

Sixth installment of report on "Underground Management in Bituminous Mines" made by Sanford E. Thompson and associates to the U. S. Coal Commission. Previous installments may be found in *Coal Age* of Nov. 8, p. 691; Nov. 15, p. 733; Nov. 22, p. 773; Nov. 29, p. 811, and Dec. 6, p. 845. Other sections of this interesting report will follow later.

Table II—Estimates of Number of Mine Cars as Prepared by Mining Officials

	Mine A	Mine B	Mine C
On shaft bottom or outside stand			
Loaded trips.....	1	2	2
Empty trips.....	1	2	2
Main-line locomotive trips per locomotive.....	1	2	1
Trips per parting.....	1½	½	1½
Gathering trips per gathering locomotive.....	0	0	2
Cars per loader.....	½	½	½
Cars under repair.....	12	40	20
Cars for loading rock.....	20	100	15
Total cars figured.....	562	602	632
Number of loaders on which estimate is based.....	298	275	240

plenty of mine cars, even if the miners and foreman may call loudly for more.

Some general managers were candid in outlining such a policy as the determinant of their car supply; others stated that two cars per loader was a rule that worked well in the mines of their district and they bought cars on that basis. Those executives who were finally prevailed upon to furnish data for the determination of the correct number of cars for a particular mine in general based their results on the consideration of eight points, and three typical examples are shown in the Table II.

The principal unit used as a basis for figuring the greater part of the necessary mine cars was the trip, by which in this case is meant the maximum number of cars hauled by one haulage locomotive at one time.

Table III represents the actual condition at time of visit:

This unit, therefore, has been given in making up this table as its variations represent the only real basis of comparison between the methods of figuring cars at different mines. The number of cars in a main-line trip at Mine A was 30; at Mine B, 25, and at Mine C, 22, and in a gathering trip at Mine C, 6. The figures are presented as illustrative of methods used without attempting to present or recommend a general formula

Table I—Number of Cars and Other Data Bearing on Haulage at Twelve Mines

Mine	HL	YT	AS	TP	OW	SP	DS	RZ	GH	TS	RM	DI
Number of mine cars..	1,800	375	400		340	500	561	600	576	500	603	
Tipple capacity, tons..	8,250	1,250	2,000	2,500	4,000	4,000	3,000	5,000		5,000	3,000	3,000
Storage.....	A day's output (2 mines)	Trestle open storage	Storage plant	None	750 ton bin	None	460 tons	1,000 tons	None	None	Surplus mine cars	400 tons in bins
Main line locomotives (all trolley).....	13-ton		13-ton	13-ton	13-ton	10-ton 8 ton T. cable from rooms	13-ton	13-ton	13-ton	13-ton	13-ton	15-ton
Gathering locomotives	{ 13-ton T. 6-ton B. Mules }		6-ton T.	6-ton T.	6-ton T.	{ 10-ton 8 ton T. cable from rooms }	Mule	8-ton T.	6-ton T.	Mule	6-ton B.	6-ton B.
Gage, inches.....	48	42	44	44	44	44	36	42	42	42	44	
Thickness of seam, inches.....	61	52	66	130	43	72	68	120 (102 mined)	60	60	63	86

T.= trolley; B.= battery, in describing locomotives

Table III—Cars at Time of Visit

	Mine A	Mine B	Mine C
Number of cars owned.....	561	602	576
Number of tons produced.....	1,600	1,500	3,200
Number of miners working.....	275	168	257
Trips per car per day.....	2.23	1.32	1.92
Average main-line travel per loaded trip.....	9,000 ft.	5,500 ft.	4,500 ft.

or to indicate all of the variables that should be taken into account in an accurate analysis.

Mine A was operating with two main-line haulage locomotives of 13 tons capacity, one of which was helped by a relay haulage locomotive of 8 tons capacity, having a combined average haul of 9,000 ft. The cars, which were all small—2,700 lb. capacity—were all gathered by mules. These cars traveled from face to tippie and back again 2.23 times per day. The two haulage locomotives were running alternately and very evenly, and the figure of the management of a half trip of loads on the bottom parting was adequate as a haulage locomotive arriving at about that time with a loaded trip took away the trip of empties, so that the total cars at the bottom, both loads and empties, was  $1\frac{1}{2}$  trips at all times.

At the relay parting the haulage locomotive dropped its empties and picked up its loads. Thus the management figure on one trip of cars for each haulage or relay locomotive was borne out by the facts, as each of the three had practically continuous traveling. On the arrival of the relay or haulage locomotive at the face parting the full trip on the parting was picked up and the empties left. Thus a figure of  $1\frac{1}{2}$  trips per parting resulted in a theoretical assured supply of empties for the mules and loads for the motors.

No allowance for the cars for the mules was made, as it was assumed that the cars on the parting and allowance for one car continually at every other miner's place would cover those actually in transit behind the mules. The above method of figuring cars for the mine under consideration resulted in continuous delivery of coal to the tippie, which was the aim of the officials, and from their viewpoint the method of figuring was therefore correct.

In spite of that, however, both the foreman and the miners were complaining of an insufficiency of cars, and an insufficiency from the miner's standpoint there undoubtedly was, as the plan called for a car at his place only half the time he was in the mine. This is a case, however, of too many men for the mine capacity rather than an insufficiency of mine cars. Though the distance of the main haul was comparatively long (9,000 ft.) and the gathering was done by mules, the average use or turn of the cars per day of  $2\frac{1}{4}$  was among the highest noted at any of the mines visited.

#### HERE FOUR TRIPS WERE ALLOWED FOR BOTTOM

Mine B was operating with three main-line haulage locomotives of 13 tons capacity, and their average length of haul was 5,500 ft. The allowance for a combined loaded- and empty-car supply at the shaft bottom of four trips as compared with only  $1\frac{1}{2}$  in Mine A is due to the fact that the arrival and departure of the locomotives were very irregular, and the officials apparently deemed it necessary to plan on such a large supply as an insurance against lost hoisting production caused by poorly dispatched haulage.

The reason that two trips are figured for each haulage locomotive in this mine is that they planned one

trip as being hauled and the other trip waiting to be picked up at the partings. As a result the figure of  $1\frac{1}{2}$  trips supply for each parting represents merely the working surplus there. In this mine the cars per loader were estimated at only one-third. If such a plan were actually operated when the mine was running at full capacity it would result in the miners waiting about 50 per cent of their time for cars. The turn of 1.32 cars per day at this mine for a 5,500-ft. haul was among the lowest noted and was in a large part due to the fact that the mine was not operating at over 50 per cent of its capacity.

Mine C was operating with four main-line haulage locomotives of 13 tons capacity traveling an average distance of 4,500 ft. Four trips of loads and empties were estimated as being always at the bottom because in Mine C, as at Mine B, the trips arrived at irregular intervals. The allowance of one trip for each haulage locomotive and  $1\frac{1}{2}$  trips for each parting is in line with the theory followed in Mine A, that a trip should be figured for each main-line locomotive and something more, that a trip should be awaiting its arrival at the parting.

The allowance of two trips to each gathering locomotive is in addition to anything figured in the previous two cases and merely had the effect of increasing the cars allotted per man, which is one-half, as in Mine A. Here, however, the men worked in pairs, so that the theoretical effect was to keep a car continuously at each loading place, which represents the ideal condition from the miner's point of view. Practically, however, this condition did not prevail, as not only were the miners here as elsewhere waiting for cars but the tippie was idle 47 minutes in addition to incidental delays in an eight-hour day due to non-receipt of cars at the shaft bottom.

In none of the cases noted was definite allowance made for storage of coal in mine cars overnight to even up a part of the daily irregularity in the car supply. This is a point which is recognized by many mine managers as worthy of practical consideration.

#### CAR EXCESS WILL NOT SOLVE HAULAGE PROBLEM

This illustration is only one more link in the chain of evidence accumulated in the study of the mines outlined in the report, tending to show that, even in cases where a concrete plan exists for determining the proper number of pit cars for a mine operation, and this plan is liberal in comparison with the standards of similar mines, an adequacy of mine cars is not *per se* a solution of the problem of either continuous tippie operation or the elimination of lost time to the miner.

Planning and dispatching of the haulage not only will go further toward eliminating both, than the purchase of additional cars, but probably in many cases it will make possible a reduction in the number of mine cars in use. Furthermore, it will permit more accurate determination of the minimum capital outlay for the mine cars that will give satisfactory service.

A REPORT has just been issued by the U. S. Geological Survey on the Twentymile Park district of the Yampa coal field, in Routt and Moffat counties, northwestern Colorado. The Twentymile Park district includes only the southeastern part of this great field, but that is now its most important part, as it contains all the commercial mines that have been developed in the field.



## Case of Opponents of 1921 Agreement In British Coal Mines



Unfair, They Say, to Make High-Cost Mines Pay Higher Wage Because Low-Cost Operations Earn Profit—Complicated Adjustments Required—Unwarranted Assumptions Enter

BY PAUL WOOTON  
Washington Correspondent of *Coal Age*

IN LAST week's article of this series this statement was made in connection with the discussion of the British coal agreement of 1921: "In those cases where the proceeds have been sufficient to meet the standard wages, other costs and standard profits, but insufficient to pay the mine workers the minimum wage, the operators have had to surrender the whole of their standard profits and are not allowed to carry forward against future income any such deficiency in their standard profits." This assertion has been questioned in view of the fact that it is provided in the text of the agreement that "if in any period the ascertained proceeds, after the deductions of costs other than wages and the cost of the standard wages, prove to have been insufficient to meet the standard profits, the deficiency shall be carried forward as a first charge to be met out of any surplus in subsequent periods."

A subsequent ruling on that provision, however, makes it inoperative. The provision is quite similar to agreements that have been reached in this country under which work is to continue until a decision is reached as to wage rates, whereupon it is to be retroactive. The plan is carried through if the decision provides an increase of wages but would obviously be inoperative should a decrease be ordered. No one would expect the miners to return any wages already paid.

It is generally agreed that one of the main objectives of the agreement would be lost were deficits allowed to hang over the more profitable periods. One of the main purposes of the arrangement is to stimulate productivity. A major need of the British situation is to increase the output per man. The only way this can be accomplished is to keep free of encumbrance the possibility of an increased wage at those times when the profit can be pushed to higher levels.

### PROGRESSIVE ELEMENT FAVORS PROFIT SHARING

So much has been said in this series of articles in favor of the profit-sharing arrangement that the impression may have been given that there is no great amount of objection to it. Unfortunately there is another side of the picture. It can be said that the overwhelming majority of the forward-looking men in the British industry have great faith in the agreement and are prepared to stand by it. It is only fair, however, that some of the views of those contrarily minded should be set forth.

The agreement, some contend, is very unfair to the high-cost mine. The high-cost mines in a district are called upon to pay a higher wage because the low-cost mines have earned profits. The production of the high-cost mines is essential to the prosperity of the country. Under the agreement, it is predicted, the high-cost mines gradually will be eliminated, leaving in operation only the best situated properties. This would mean

great loss of production and restriction in employment.

There also is objection to the singling out of coal-mine labor and its removal from the effect of the general laws which apply to labor in comparable industries. It is contended by able men that labor must be considered as a whole. Any effort, they believe, to remove one class of labor and set it apart so that general economic principles are regulated in their application to the one group, constitutes a fundamental error which is certain to wreck the coal agreement in time.

Formerly wage advances were calculated in percentages. Under the agreement there is a change to a flat rate. This complicates greatly the maze of adjustments which have to be made under the agreement. One criticism is to the effect that the agreement appears to settle everything, but in fact it has settled nothing and has brought about dangerous confusion in a basic and highly essential industry.

### OWNERS OBLIGATED TO HAPHAZARD SCHEME

As one critic puts it, "The coal owners are under obligation to pay certain wages determined by the haphazard amount of wages found to be payable at a certain date, plus, under certain circumstances, another arbitrary amount. Wages are to be determined at a certain figure quite irrespective of the circumstances which may prevail at the time when they have to be paid. The men working in a particular district are to be paid not what the labor of such men is worth in the country at large but such additional sum as may have been found due to them, long after the service has been rendered, after a complicated set of returns has been obtained from their employers and after a yet more complicated set of calculations, based on further assumptions." Even the assumptions are regarded as unwarrantable.

The uniform plan set up for accounting purposes, and which applies to the whole United Kingdom, makes for a series of inequities in certain districts, it is asserted. It is apparent that great difficulties surround the determination of just what constitutes profit in the production of coal. It is very difficult to lay down nationwide rules which do exact justice to every miner. One of the main causes of disagreement between the operators and the mine workers has been in regard to capital expenditures. It is apparent that improvements of a very substantial nature might be justified at a mine with large reserves of unmined coal. It is said that the men object to many expenditures which are essential to the business-like handling of the property. There is a natural tendency among the men to have for immediate division a larger proportion of the income than is justifiable. They are not inclined to take into account the fact that an improvement today will mean increased profits at a subsequent period.

## Operators Open Anthracite Economy Show

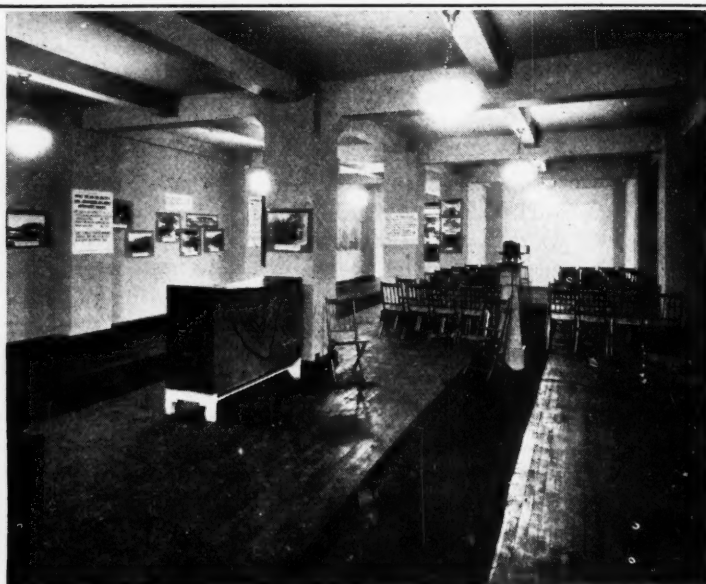
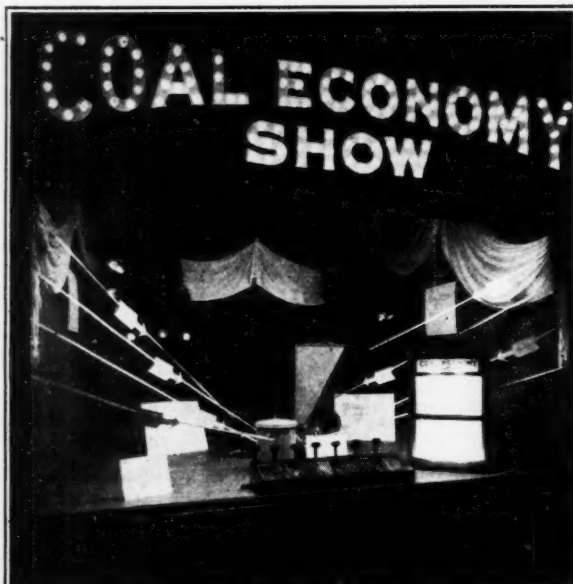
**I**N ORDER to show how, by the use of proper heating appliances, the smaller and cheaper sizes of anthracite may be burned in household plants, the General Committee of Anthracite Operators in conjunction with manufacturers of heating appliances, has opened the Coal Economy Show at 1017 Chestnut Street, Philadelphia. The main floor, shown in the lower right picture, is given over to appliances and an information booth where fuel experts are in attendance to answer questions. On the main floor, shown in the picture on the lower left, there is a mine car of run-of-mine anthracite. Beside it is a series of seven bins holding the various prepared sizes from egg to barley, thus illustrating the difference between coal as it is mined and as the public gets it. The upper right picture shows a portion of the mezzanine where there is an exhibit of photographs showing various mine operations—breakers, machinery, pumps, maps, houses, schools, etc. There also are placards giving statistics and information

about the industry—models of a breaker, a jig and a mine barrier. At the upper left is a display window.

There is an auditorium where illustrated lectures on coal and mining are given twice daily and where a 2-reel movie will be shown twice a day. Special evening sessions are to be held for associations of architects, builders, plumbers and steamfitters, contractors, high school and college students.

It is planned to open other similar shows in Washington, Boston, and New York.

Among the exhibitors represented are the Molby Boiler Co., Lansdale, Pa.; Abram Cox Stove Co., Philadelphia; W. P. Mackenzie Co., Philadelphia; Philadelphia Steam Heating Co., Philadelphia (Oxykol system); Standard Heater Co. (Spencer heater), Williamsport, Pa.; Keystone Supply & Mfg. Co. (distributors Newport automatic feed heater), Philadelphia; Burn-Buck Co., Philadelphia; Culm-Burn Equipment Co., Inc., Philadelphia, and Domestic Stoker Co. (The Electric Furnace Man).





## News of the Industry

### Tri-State Meeting at Cleveland Jan. 4 To Begin Work on New Bituminous Scale

Ohio-Indiana-Illinois Joint Conference Issues Formal Call Dec. 21  
for Parley—Actual Progress Unlikely Until After  
Union Convention, Jan. 22

Negotiation of a new wage agreement affecting mine workers in the bituminous coal mines, to replace the present agreement, which expires March 31, will begin in Cleveland, Ohio, Jan. 4, when a joint meeting of union officials and operators of Ohio, Indiana and Illinois will be held. The call was issued Dec. 21 and was signed by Michael Gallagher, of Cleveland, chairman of the Joint Interstate Conference of Ohio, Indiana and Illinois, and John L. Lewis, president of the United Mine Workers of America.

S. H. Robbins and W. H. Haskins will represent the Ohio operators at the conference, P. H. Penna and M. L. Gould the operators of Indiana, and Rice Miller and H. E. Perry those of Illinois.

Ohio miners will be represented by Lee Hall and G. W. Savage; Indiana miners by John Hessler and William Mitch; Illinois miners by Frank Farrington and Harry Fishwick. Officers of the joint conference besides Chairman Gallagher are: William Green, secretary, and W. L. Robinson, assistant secretary.

Besides President Lewis and Secretary-Treasurer William Green of the miners' union, Vice President Philip Murray may participate.

The call for the meeting was as follows:

"The joint conference of miners and operators, of the States of Ohio, Indiana and Illinois in session in New York City on Jan. 24, 1923, adopted a resolution providing that the chairman of the joint conference and the president of the United Mine Workers of America should designate the time and place for the meeting of the joint sub-committee, signatories to the existing contract; the sub-committee to name the time and place for the formal assembling of the joint interstate conference, to consider the making of a new wage agreement.

"Pursuant to that authorization, the undersigned advise that the members of the joint sub-committee signatories to the existing contract will assemble in Cleveland, Ohio, on Friday, Jan. 4, 1924, at the Hotel Cleveland, at 11 o'clock a.m. It is hoped that all members of the sub-committee or their delegated representatives will attend this conference."

It is doubtful whether the real nego-

tiations will take place before the convention of the United Mine Workers in Indianapolis, Jan. 22, when the miners are expected to formulate their demands and instruct their officers.

### To Force Employers to Carry Insurance on Workers

The State Workmen's Compensation Board of Pennsylvania has taken away from the State Department of Labor and Industry the enforcement of the state compensation law in so far as it relates to the mandatory injunction upon employers to carry insurance for their employees. The enforcement of this provision has been in the hands of the department for two years, the law providing that employers who do not obtain compensation insurance shall be fined \$1 a day for each employee. During this period, it was said at a recent meeting of the compensation referees at Harrisburg, not a single prosecution has been brought by the department and no fines have been imposed.

William C. Fisher, actuary of the department, who has had charge of the enforcement of the law's provision, said the State Compensation Board had refused to bring prosecutions. Since August thirty employers a month have been insured, he said, and he explained he had investigated 25,000 cases of employers who were not carrying insurance. T. Henry Walnut, chairman of the Workmen's Compensation Board, who recently pointed out that 80,000 of the 200,000 employers of Pennsylvania carry no compensation insurance, said the board will see that the law is enforced and that notice will be served upon all delinquents at once and they will be fined if they do not comply with the law within thirty days.

Royal Meeker, Secretary of Labor and Industry, has forwarded letters to all insurance companies writing compensation insurance in Pennsylvania and to self-insuring employers, asking them to furnish his department with more detailed information regarding causes of industrial accidents. An examination of the accident reports filed with the department, he said, shows that in a large number of cases the questions asked are incompletely answered "and in fact in some instances no answer is given."

### Governors Receive Draft of Pinchot Hard-Coal Bill

Gifford Pinchot, Governor of Pennsylvania, sent copies of his proposed bill to regulate the anthracite industry, Dec. 18, to the governors of anthracite-consuming states, in accordance with instructions contained in a motion passed at the conference, in Harrisburg, Dec. 13. In a letter accompanying the draft of the measure, as well as a brief upon the sources of the bill, Governor Pinchot asks that criticisms or suggestions by the state executives be sent not later than Dec. 31.

Work upon the compact to be adopted by the states will be pushed as rapidly as possible, Mr. Pinchot stated, and invited suggestions concerning its form or contents. "The proposed compact between the states," the Pennsylvania executive wrote, "offers a practical way to reduce prices to the consumers; there can be no dispute as to its legality, and it offers, as no other method can, a uniform and unbroken system of control along the whole line from the mouth of the mine to the consumer's bin.

### Portland Cement Output Off in November

Production of portland cement during November, 1923, according to a report by the U. S. Geological Survey, based partly on estimates, totaled 12,603,000 barrels, compared with 11,349,000 barrels in the corresponding month of 1922 and 13,350,000 barrels in October, 1923. Shipments for the month were 10,251,000 barrels, compared with 10,167,000 barrels in November, 1922, and 14,285,000 barrels in October, 1923. Stocks at the end of November amounted to 6,964,000 barrels, compared with 5,320,000 at the close of November, 1922, and 4,612,000 barrels at the end of October, 1923.

### C. & I. R.R. Asks Extension

For the announced purpose of opening up for development 75,000,000 tons of bituminous coal, the Cambria & Indiana R.R. has asked the Interstate Commerce Commission for authority to construct and operate an extension of its line in Cambria County, Pennsylvania. The extension is to proceed from a point where the Monroe Coal Co.'s line intersects the company's main line at Revloc. The terminus of the extension is to be at Wilmore Road, near the bridge crossing the north branch of Little Conemaugh River. The length of the extension is to be 5.08 miles.

## Says Coal Mining Needs More Engineers; Best Qualified to Handle Labor

Though Lawyer and Engineer Stand Together, It Is the Latter Who Looks Forward, Says Dr. Smith—Discusses Four Phases of Waste and Their Cure

Discussions of coal problems, Dr. George Otis Smith, the Director of the U. S. Geological Survey, pointed out in the course of remarks before the Washington section of the American Institute of Mining and Metallurgical Engineers, reveal the positions of the lawyer and the engineer. "They are standing together," said Dr. Smith, "but they are back to back—the engineer looking forward and the lawyer looking backward."

Dr. Smith presented four phases of the coal question, which formed the basis of a general discussion among those in attendance. These points were:

(1) Waste of resource—better mining; better utilization; effect of price.

(2) Waste of labor—short year and overmanning; larger use of machinery; mine management; union limitation of output; co-operative spirit.

(3) Waste of capital—overdevelopment; idle plants; limits on new development; waste through competition; combinations.

(4) Waste of transportation—the industry's bad load factor; seasonal peaks; long haul; unneeded fields.

Dr. Smith made a plea for the use of more engineers in the coal-mining industry and their utilization in connection with labor relationships. The engineer, he pointed out, has come up in a part of the work which has placed him in close personal contact with the mine worker. As a result, he knows him in a personal way and frequently is better qualified to deal with labor problems than is the mine manager, who often rises to his position through the accounting department. He believes that labor can be brought to a much higher plane of efficiency and expressed the hope that the matter of individual productivity would find a part in the program of labor leaders. He mentioned that he had heard long discourses by labor leaders but had been impressed by their failure to mention the need of increased efficiency. He expressed decided disapproval of any plan which has as its object the limitation of individual output.

Dr. Smith declared that waste is an outstanding ill in coal. There is waste from the face to the stack, he said. There is waste in man power and each time the industrial cycle goes round, these wastes seem to increase, he asserted. If there were better mining and better utilization, the equivalent of 100,000,000 tons of coal might be saved every year. He characterized as deplorable a rate situation which in one year resulted in the transportation of 5,000,000 tons of coal to the lakes from

Southern fields which displaced nearby coal equally suitable for the movement. During a six months' period that useless haul represented a loss of 1,500,000 ton-miles.

Major Starr, of the Chamber of Commerce of the United States, deplored the attitude of the United Mine Workers toward the use of machinery in mines. Where machinery is used, he declared, it is necessary to pay the men the full amount of the saving made. He cited the great economies and improvements which had been made possible in the non-union mines through maximum use of labor-saving machinery. He mentioned one mine in which there are no mules and no picks. Coal is produced there just like shredded wheat, he said—"not touched by human hands."

O. P. Hood, chief mechanical engineer of the Bureau of Mines, declared that there are many inheritances of

the days of dollar coal which must be overcome. Management must pay more attention to the boiler room, he pointed out, under the changed conditions of higher fuel costs. He expressed the opinion that there is too much imitation in engineering. One engineer will get a desirable result and others will follow like sheep. Mechanical equipment for the handling of coal must be suited to the individual problem, rather than that met with in another plant. He urged more study of the combustion problem.

Walter Trent called attention to the fact that at least 90 per cent of the values in ore are recovered at metal mines. Each ton of coal, he said, contains \$14.50 of value, but the recovery is less than 20 per cent.

H. Foster Bain, director of the Bureau of Mines, made the point that control over development would do more than any other single thing to solve the difficulties of the coal industry, but that such a policy would be entirely contrary to the principles which the American people always have supported. Public opinion would not submit to any drastic step looking to limitation of the opening of new mines. He pointed out the tendency for acquaintanceships now to run in business lines. People formerly knew each other because of their geographical proximity. Now like activities seem to control personal relationships, he said. He prescribed constant flow of facts as one of the needs of the industry.

### Praise for Oddie's Bill

Introduction of Senator Oddie's Department of Mines bill is bringing much commendation of the measure. H. Foster Bain, director of the Bureau of Mines, in a letter to the Nevada Senator, says:

"I have no hesitation, as a mining man, in expressing my personal conviction that if such a department can be created it will be of the greatest possible service to the country, as a whole, as it will to the particular industries in which you and I are especially interested. It will be of great benefit to the mining industry, and accordingly to the public interest if, so far as is possible, the various functions of the federal government that relate to mines and mining can be brought together."

Dr. George Otis Smith, director of the U. S. Geological Survey, says: "All who are interested in federal legislation which recognizes and promotes the mineral industry are gratified by the consideration of such a measure as the one you have introduced."

F. F. Sharpless, secretary of the American Institute of Mining and Metallurgical Engineers, wrote: "Our directors are deeply appreciative of your many efforts in behalf of the mining industry. They feel that in you they have a staunch and loyal advocate for every matter of merit in which the mining industry is concerned."

### I. C. C. Denies Higher Rate From Tennessee Mines

Proposed increases in the rate on coal from points on the Tennessee R.R. to Louisville, Cincinnati and other points are not justified, in the opinion of the Interstate Commerce Commission. The case was brought by the Cincinnati, New Orleans & Texas Pacific and the Tennessee R.R. in an effort to increase rates to Louisville and Cincinnati by 9c. and 10c. more than the rates from all other points of origin in the group embracing the mines on the Tennessee. A 15c. increase was proposed to points in other states in the Middle West. The proposed increases were opposed successfully by the Southern Appalachian Coal Operators Association.

In its opinion, the commission holds that the proposed rates would disrupt the general rate situation from certain of the groups involved and would give undue preference to mines on and shippers from the Oneida & Western and other short lines in the same general territory. "If the Tennessee is unable to exist under reasonable rates and just, reasonable and equitable divisions of joint rates," says the opinion, "its connections cannot be called upon to bear any additional part of its expenses. The producers of coal and lumber along its line are interested more than anyone else in its maintenance and continued operation."



## Illinois Sees Coal Strike April 1, but It May Be a Short One

Long Fight Likely Only If Miners Insist Upon Wage Increase—Operators' Association Favors Four-State Parley and Wage Cuts—  
"Wages O. K.," Some Say

Illinois is looking toward April 1. Now that the Illinois Operators Association has gone on record as favoring participation in four-state negotiation by Illinois, Indiana, Ohio and—faint hope—western Pennsylvania, and a reduction in miners' wages, the question, will there be a strike? is much at the fore. The general sentiment throughout the state is that there certainly will be a strike. It may be short if the miners will be willing to renew the present wage contract, or it may be long if they will not. But it will be difficult to avoid a shutdown.

The action of the association, taken in Chicago Dec. 20, gives form to one body of opinion in Illinois. But not every important operator favors a drive to reduce wages, necessary though that may be to many companies. Some declare there is no use trying it and that they will not fight for such a thing. Therein lies the chance for a strike of only short duration. It is calculated that the mental attitude of mine labor will make it difficult if not impossible for President John Lewis to sign a continuance of the present scale before April 1. Hence the necessity of a shutdown—unless government pressure upsets negotiations between operators and miners.

However, the Illinois operators who will not fight for wage cuts will fight against wage increases. They say so flatly. Therein lies the chance for a long strike. They recognize that one of the worst things for the industry would be a long strike. It would revive a lot of wildcat operating that is now either dead or dying and which, they think, ought to be permanently trimmed off the body of the industry. But even that constant menace is not enough to feaze them. The suggestion for wage increases makes them see red and battle light appears in their eyes.

Of course it is generally believed that the 10-per cent increase which is noised abroad in labor circles as one of the probable demands of the union is merely "swap talk." It is to be traded by the miners for operator proposals, such as the well-worn ones about discontinuance of the check-off, division of the country into small districts for wage-making and the like.

There will be some new proposals by the operators this time, however. One of them concerns a wage scale for underground loading-machine operation. At present there is no scale although a good many machines are now working in such unionized regions as western Kentucky, Indiana and Illinois. Western Kentucky's general wage contract runs another year, but that field looks on with interest while the Middle West maneuvers for a recognized

loader scale. Quiet negotiations between operators and miners in Indiana thus far have gained little ground. Operators insist upon a day scale and miners upon tonnage rates, and there they split. However, there have been some faint indications that the parties to the case are really closer together than they seem, for many miners are seeing the light.

This and other questions will be taken into the coming conference by Midwest operators, and earnest efforts will be made to get something done about them. But the sentiment generally is that the whole problem is too complicated to be wound up by April 1.

### Strike Called Off in Maryland Cost Union \$734,000

In the *United Mine Workers Journal* of Dec. 1 is a formal statement, informative in a general way, of the decisions of the Policy Committee that John L. Lewis foregathered in Indianapolis for several weeks in November. The miners' organization spent nearly three quarters of a million dollars in supporting the 20 months Maryland strike beginning April 1, 1922. Nothing was said about West Virginia. The statement follows in full:

"After being in session more than a week, the International Executive Board of the United Mine Workers of America transacted an enormous amount of business, adjourning Nov. 20. A greater part of the session was devoted to reviewing the work accomplished and now under way by the organization in the various districts within the confines of the jurisdiction.

"The board, after going over the matter of the revocation of the charter of District 26, Nova Scotia, in July this year, approved the action of the International officials and authorized a continuance of the provisional district under the direction of the International union.

"The matter of the strike in Maryland, District 16, which has been on since April 1, 1922, was discussed and the board made arrangements for the termination of the strike. During the period of the strike financial relief to the members of the district was advanced in the total of \$734,000, it was announced.

"The International board together with the officers of the International union were authorized to continue their efforts to obtain action from the Interstate Commerce Commission relative to the matter of "assigned-car" practice as indulged in by railroads, public utilities and large consumers of coal.

"The board gave considerable atten-

tion to the program of litigation in which the organization is now involved, due to various damage suits, injunctions and other legal processes brought against the organization in the various districts. The matter of litigation in Alabama was especially gone into.

"The organization is facing a number of damage suits. The board was particularly interested in the victory won by the union in the second trial of the Coronado case. It is believed that the winning of this case by the miners will have set a strong precedent as to the final outcome of several similar suits now pending against the union.

"The board had a large number of appeals and grievances from the various districts, and these were taken up for decision. The finances of the organization were reviewed and found to be satisfactory. There will be no further meeting of the board until after the convention in January."

### "And Satan Also Came"

When Governors Pinchot, of Pennsylvania, and Silzer, of New Jersey, occupied places at opposite sides of the toastmaster at the annual dinner of the New Jersey Society of Pennsylvania, Dec. 18, in Philadelphia, 300 members of the society were prepared to see the fur fly—and they were not disappointed.

"I thought I would say something about coal tonight," said Mr. Pinchot, "but you will realize the position a fellow is in who has not yet been able to determine whether he was successful in getting coal in the homes of the people or was merely responsible for raising the price.

"I called a coal conference of Governors some time ago with the idea of doing something to decrease the price. Not many Governors responded, but Silzer did. I wonder if it would be unfair in this connection to recall an old quotation which runs, 'And Satan also came.' At any rate, Governor Silzer was there. I tried to convince him that New Jersey might also be persuaded to take her share in the responsibility of reducing the price of coal. But he couldn't see it. He wanted Pennsylvania to do it all. But I beat him to it by calling another conference, and he didn't come. But the Governors who did decide that the other states should help, including New Jersey, and so, you see, he's in the game anyway."

"I do not object to the Governor's quotation, 'Satan also came,'" said Governor Silzer in reply to Mr. Pinchot, "because I have a distinct impression that on the occasion he refers to the Governor of New Jersey gave the Governor of Pennsylvania a little bit of hell."

## Oddie Studies Coal Commission Report; To Base Legislation on Findings

Constructive Bill to Promote Better Service by the Industry Expected—  
Co-operation with Hoover Likely on Commercial Phases—  
Pinchot Conferees Soon to Press for Federal Action

BY PAUL WOOTON

Washington Correspondent, *Coal Age*.

An intensive study of the report of the Harding Coal Commission is being made by Senator Oddie, of Nevada, chairman of the Committee on Mines and Mining, with the idea of translating into legislation such of the recommendations as may meet his approval. He has not proceeded far enough with the study to determine just the form this legislation will take. It is entirely probable that it will incorporate certain suggestions which have been made since the report of the Coal Commission was issued.

It is a relief to many who are deeply interested in the best interests of the coal industry to know that the legislation to grow out of the Coal Commission's report is to be handled by a legislator who is entirely constructive in his tendencies. For that reason it is safe to assume that the administration measure will not come out as full of teeth as a corn shredder, vesting the Federal Trade Commission with powers to conduct a new program of regulation of the punitive type. Senator Oddie is confidently expected to bring out legislation which will seek to foster and promote the coal industry along the lines that will enable it to furnish better service to the public.

Bills that have been introduced at this session have been designed to lambaste profiteers or deal with first-aid matters such as penalizing shipments of dirty coal or embargoing exports.

### PRODUCTION CRUX OF COAL PROBLEM

Senator Oddie feels that since the whole coal question revolves around its production, it really constitutes a matter clearly within the jurisdiction of the Committee on Mines and Mining. The parliamentary officials of the Senate have taken the same viewpoint and Senator Oddie believes his committee is in a better position than any other to handle such fundamental coal legislation as the country may need. On the commercial phases of the problem, it may be accured that Senator Oddie will work in close co-operation with Herbert Hoover, Secretary of Commerce. In fact he already is co-operating in a major way with Secretary Hoover on various problems having a bearing on metal mining.

Legislation now is imminent from another quarter. It is expected that the Governors who participated in the Pinchot conferences soon will have agreed on the draft of a bill which they will put forward. There is some surprise in Washington that the diverse interests represented by the consuming states should have come to an agree-

ment so readily. While the effort is going forward to obtain the interstate pact, it is clear that the principal hope of the Pinchot conference is in federal action. If the Governors of these states represent the trend of public sentiment, it will mean strong pressure for federal action. Enough is known of the Pinchot draft to indicate that it is another suggested code of penal rules. For that reason there is a feeling that it is particularly timely that Senator Oddie should be considering the bringing out of legislation of a more constructive type.

### Bureau of Mines Reports on Work of Past Year

Practically 100,000 miners have been trained by the Bureau of Mines in mine-rescue and first-aid methods since the establishment of the bureau in 1910, states Director H. Foster Bain, in his annual report to the Secretary of the Interior for the fiscal year 1922-23. Whereas in 1910 the bureau trained 734 men, during the past year 14,941 men received the training, which was conducted in 35 states and Alaska.

Two effective methods for preventing the spread through a coal mine of a minor initial explosion have been demonstrated by the bureau at its experimental mine near Pittsburgh, where more than 500 experimental explosions have been produced and in which the explosibility of coal dusts from all parts of the country has been studied. The first method is to wet the dust so thoroughly that no dry dust remains in the mine. The second is to dilute the coal dust with shale dust, limestone dust, or other non-inflammable dust so that flame will not pass from point to point.

The widespread attention given to the fatalities from explosions has resulted in the common supposition that gas and coal-dust explosions form the main hazards of mining, but the bureau finds that if the deaths from falls of roof and coal could be eliminated, the number of miners killed would be cut approximately in half. The deaths from roof falls aggregated 900 during 1922. The fact that this number is less than the total during several preceding years is due to thousands of men having been idle for several months during the bituminous-coal strike.

The larger part of the responsibility for decreasing this class of accidents may fairly be placed on the miners themselves, states Director Bain. Most of the falls occur at the working places and the miners there are better able

to observe the conditions under which they work and to tell when the roof should be taken down or additional props put up than is anyone else.

For the 11-year period that ended with 1922, 47.84 per cent of all fatalities were due to falls of roof and coal, 16.85 per cent were caused by mine cars and locomotives, 11.25 per cent by gas and coal-dust explosions, 6.04 per cent by explosives, and 3.47 per cent by electricity. During this period 25,975 men were killed in coal mines. Approximately 90 per cent of all the deaths occurred underground, 2.29 per cent were from shaft accidents, and the remainder, 7.59 per cent, occurred on the surface.

Director Bain cites the need for an intensified safety campaign among miners, operators and inspectors to maintain diligence in observing the precautions which will lead to the prevention of accidents. This includes a wider dissemination of the knowledge already acquired by the Bureau of Mines and the agencies which have been co-operating with it.

An intensive study of the electrical hazards in coal mining and of those following the more extensive use of machinery underground should be made.

Concentrated effort should be made to reduce the number of deaths from falls of roof and coal and from mine transportation, both of which call for further investigative work and renewed alertness by miners and operators.

Coal is now being mined on public lands under lease in Colorado, Montana, New Mexico, North Dakota, Utah, Washington and Wyoming. Prospecting permits have been issued covering areas in these states and in Alabama, Arkansas, Arizona, California, Idaho, Nevada, Oregon, and South Dakota.

A vertical oven, designed to produce a lignite char as a stable fuel for domestic and power purposes, was built and operated in co-operation with the University of North Dakota. Some of the char was shipped to the Pittsburgh station of the Bureau of Mines, where grates suitable for burning it in an ordinary cookstove were designed which proved successful in laboratory tests. The lignite char proved an admirable fuel.

Improved methods and a portable instrument were devised for determining quickly the severity of cases of carbon monoxide poisoning and the carbon monoxide content of mine atmospheres. Important economies were effected in fuel consumption and in operating practice at various plants making refractory wares and at brick kilns.

HENRY WALKER, a mining engineer who is serving as deputy chief inspector of Mines for Great Britain, will visit this country in February. Arrangements are being made by George S. Rice, chief mining engineer of the Bureau of Mines, which will make possible first-hand observations as to safety methods employed in American mines.





### Method of Suspending Feeder Cables to Many Levels

Up until about ten years ago power was supplied to electrical equipment in the anthracite mines by means of cables suspended in the airshaft, which usually is just alongside of the regular hoisting way. This served the purpose rather well for a time, but as the equipment increased and an entire operation

depended upon the feed lines hanging in the shaft, frequent stops due to the burning of the wires in wet shafts compelled officials to look around for some other method.

The old oak-pin side bracket, nailed to the shaft bunting, and fitted with a deep-grooved glass insulator to which the 4/0 weatherproof wire was fastened by a copper tie wire, soon gave way to the armored cable, supported only at the top of the shaft and allowed to hang free alongside of pipes and other obstructions in the shaft. Following this came the boreholes, generally about 12 in. in diameter and protected from water by pipe cemented in on all sides. The usual procedure was to start this hole from the surface and drill down through probably a half dozen different veins. In this way the hole was in the solid at all points. After its completion it was tapped at all veins and sufficient of the pipe cut away to allow connections to inside feeders.

A sufficient length of cable to reach from the surface to the first vein and into a set of switches at that vein, is now dropped and anchored to supporting spools at the top of the hole. A set of copper busbars is then installed a foot or so away from the bottom of the hole at the first vein. One of these busbars takes the positive and the other the negative cable. A tap is taken from the negative busbar and run directly to the rail in the first vein or level. A second tap is taken from the positive busbar, thence to a switch of sufficient capacity to withstand the maximum current which will be demanded by the equipment in that vein, and out of this switch to the trolley wire.

A second cable of sufficient length to allow for anchorage at the first vein and running to the second vein is placed in a manner similar to the way it was handled in the first vein. This method is carried on at all levels, making it possible to disconnect any individual vein from the main cable in case of trouble with feed lines or trolley wires due to falling roof in the workings.

For a time after the adoption of the cemented-in pipe between the veins, the cables were installed without cutting at the various veins and were allowed to hang their entire length from the surface to the lowest vein to which power was being furnished. Taps were taken from the cables as they passed each vein, the positive cable leading to a

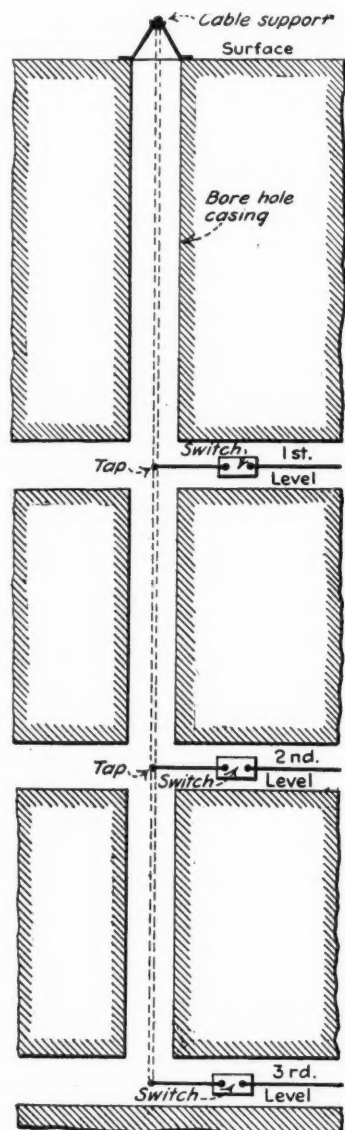


FIG. 1—CONTINUOUS CABLE FROM SURFACE TO BOTTOM LEVEL

At each vein the cable is tapped. A disadvantage of this plan is that a break anywhere in the cable is likely to carry all the switching equipment of each lower vein with it as it drops.

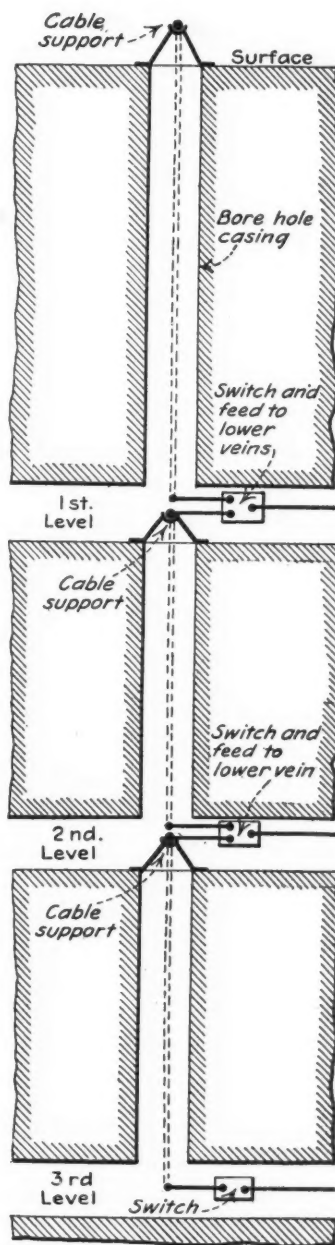


FIG. 2—SEPARATE CABLE TO EACH LEVEL

This arrangement requires a separate cable support for each section of cable, but repairs may be more readily made with a short piece of cable. Latest practice is along these lines.

section switch and the negative cable to the rail.

This was found to be an expensive way to install cables inasmuch as a grounded wire between the surface and the first vein generally resulted in the

cable burning off and causing it to drop to the foot of the hole, taking with it much of the switching equipment connected to it at the various veins. With the present scheme, however, it is possible for any one of the separate cable lengths between the veins to burn off and drop in the hole without destroying the rest of the system other than cutting off the supply to any vein below the affected cable. The repairs therefore consist only in dropping a short piece of cable, of the length required, between the two veins. In the first case, where the cable was in one piece from the top to the bottom, it was always necessary to drop new cables the entire length of the hole as well as to make new taps at all of the veins. Short lengths of cable, well anchored and installed in a perfectly dry hole, provided they are of sufficient cross-section to carry the maximum current, will last for years without giving trouble of any kind.

Scranton, Pa. M. S. BEDDOW.

### Important Mechanical Details Of Locomotive Motor

Dust, sand, etc., when mixed with oil, have a grinding action on the bearings of locomotive motors, wearing away the bearing linings as well as the shaft or axle. As a result, various means have been taken to make these bearings dustproof and thus extend their life in service.

It is necessary to keep dirt, water, etc., out of the oil so that it will not be drawn into the bearing surface with the oil. This is done by having a tight cover over the oil and waste pockets, held in place by a spring. This cover should be lined with felt and should have a deep lip to prevent wheel wash, etc., from splashing in.

#### KEEP DUST CAP TIGHTLY FASTENED

The outer end of the commutator end armature bearing is ordinarily protected by a dust cap over the end of the shaft. This cap is made of sheet steel or malleable iron and is fastened to the housing or the bearing by bolts or screws, completely enclosing this end of the bearing. This dust cap should always be kept in place, as the position of the bearing with respect to the wheel flange is such as to permit the dirt, sand and wheel wash from the wheel flange to be thrown directly on this part of the motor.

The outer end of the pinion end bearing usually extends into the gear case and needs no further protection. The gear case fits over the armature bearing or an extension of the housing with a sufficiently close fit to keep the lubricant in the gear case and tends to keep dirt out of the bearing at this point. There is little possibility of dirt, etc., getting into the armature bearings from the inside of the motor, as the oil throwers on the shaft and oil catchers on the housings act as guards and give ample protection against the entrance of dirt.

### Stress Importance of Bonding And Get Better Voltage

Until such time as those most concerned in keeping the electrical equipment in mines up to the minute realize that building of haulage tracks is just as important as the trolley wire, and is the return for whatever power is sent out by the trolley wire bonding will not be taken seriously. It is surprising what little attention is given to this important link in the chain power feeders.

Electrical men who give scrupulous attention to the installation and maintenance of trolley wire leave the other side of the circuit to a bonder who frequently is too young to know that he must do his work well if the locomotive which is to operate on a certain road after he is through bonding is to perform in a satisfactory manner. Channel pin bonds are sometimes installed in too hasty a manner, and quite frequently the channel pin, instead of being driven straight with the hole, in which case it will press in on all sides of the bond securely, will be allowed to cut into the wire and sever it almost in two. Hence a high-resistance joint is the result, and if two or three of these occur on a long, steep hill, power troubles can be looked for. It seems a foolish thing to insist on a well-kept trolley if the bonding is not also installed properly and kept in good condition.

#### IMPORTANCE OF THE BONDER

A bonder should be given to understand that his job is not merely a stepping stone to the higher position of electrician. He must first be a good bonder, else his chances for being a good electrician will not amount to much. Make him understand this, at the same time impressing on his mind just why he holds an important position. Explain to him just what the bonds he installs are doing and the damage they can do if not put in properly. Make him clean all holes in which the bond and channel pin are inserted, and insist that the pin shall be driven in straight and true, so that there will be no cutting away of part of the cross-section of the wire itself. Make him understand, also, why the pin should be driven all the way home, why this will result in preventing moisture from entering and destroying the fit of the hole, and finally, take him into your confidence and explain just why he must be a good bonder if he ever hopes for anything better.

It is remarkable how the efficiency of a mine will pick up once the bonding is put in proper shape. When a sudden complaint comes to the electrician that the power in a certain part of the mines has fallen off it usually will be found to be due to neglected bonding. An efficient bonder is worth his weight in gold to an electrical organization, and it is a surprising thing how much his work will improve when he is given to understand that what he does is of value and is appreciated as such by the whole organization.

ELECTRICAL INSPECTOR.

### How the Maximum-Demand Indicator Operates

When the maximum demand register is part of the watt-hour meter mechanism, the meter, in addition to recording the amount of energy used, gives the maximum demand at which this energy has been used. The operation of the maximum demand indicator usually is by means of a pusher which at the beginning of a predetermined period of time advances the maximum-demand indicator hand over the scale. The speed at which this maximum-demand indicator can operate is a function of the speed of the meter disk.

At some predetermined time interval the forward motion of the pusher ceases and it is instantly withdrawn or reset to a point where it starts to travel again for the next time interval. The indicator hand is, however, left at the point on the demand scale to which it has been advanced by any previous operation of the pusher and it is not advanced until a higher maximum demand comes upon the line. Most meters are arranged to be manually reset by the meter reader or meter inspector.

The position of the maximum-demand indicator records the maximum demand which has occurred since the last time the meter was reset, providing the time intervals during which the pusher is moving are constant. This brings out an important point in connection with maximum-demand meters, and that is that the timing device be very accurate. In a newly designed meter this timing is accomplished by means of a synchronous motor which inherently operates at a definite speed; in fact its speed can change only with the frequency of the alternating-current supply, and since the frequency of the system is constant, the synchronous motor drive must be constant. This feature represents one of the latest developments in maximum-demand meters.

### Banking Power-Plant Fires

The fire under the boiler should never be banked until it is quite certain that there is not going to be a demand for the use of this boiler for a few hours, as much of the coal burned during the banking is a loss and if the fire is prepared for banking just before a load comes on, much time is lost in getting the furnace back into favorable operation. While the fires are banked the stokers should be periodically moved to prevent the fire bed from becoming too porous or honeycombed.

The usual procedure in preparing and banking the fire during periods of low demand is this: (1) The forced draft is shut off; (2) the induced and forced draft fans are stopped; (3) the stokers are stopped; (4) the damper on the stack is closed to a degree just sufficient to clear the furnace of gases; (5) the feed water valve is closed.



# Problems In Underground Management

## Shaft Designed to Make Replacement of Buntons Easy and Avoid Wreckage

When a Cage Runs Wild the Buntons Catch It and Much Damage Is Done If They Are Torn Out—A Way to Minimize the Destruction

The main shaft of an important American mine has been lined with reinforced concrete from 1 ft. to 2 ft. thick on all sides, the concreting extending from the sump bottom to the surface, a total height of 150 ft. The sump is 12 ft. deep and the net opening of the shaft 11x15 ft., the concrete bottom resting on hard rock. The shaft lining continues upward, and where it passes through the coal strata, the walls are extended to a width of 24 ft. and are made 2 ft. thick with a suitable design to support the roof of the shaft bottom and to make it possible to load and unload rails or pipe on the bottom without lack of headroom or other similar difficulties.

In casting the concrete, a channel, or long, narrow recess 12 in. wide and 2 in. deep and extending the entire distance from the sump to the ground landing, was provided in the side walls for the reception of the buntons, which were placed after the concrete had set and the forms had been removed. The buntons are 10-in. iron beams the ends of which are provided with angles. On one end these angles are riveted and on the opposite end they are bolted. The bolted angles are designed so that they can be removed if necessary should an accident or other cause make replacements obligatory. By drifting the angles, the original tension always can be expected on buntons so installed.

### CAN READILY INSERT NEW BOLT

For the reception of the guides a cast-iron chair provided with a T-slot was bolted to the web of the buntons. These castings are so arranged that a new bolt can be inserted readily, should it become necessary to do so. These castings or chairs not only support the guides but form for them a permanent base or line. The guide replacements go against the face of the chairs previously set to line and secured, and thus automatically they come truly to a plumb line with their faces in correct position.

The buntons were inserted in the slot and securely keyed with iron wedges to the proper tension. Then the entire channel was filled with a lean mixture of cement mortar, troweled

flush with the side walls of the shaft. Should it become necessary to remove any of the buntons, a pick will cut the lean mortar and expose the bolted angles, which can then be removed, allowing the buntun to drop out of the slot for removal. Should an accident occur in the shaft severe enough to dislodge the buntons, the lean mortar will yield to the strain and break away without serious damage to the buntun itself.

The concrete end walls are provided with T-slot castings set into the mixture at the time of casting and permit of bolt removal, and in general these castings resemble the chairs fastened to the buntun for the purpose of supporting the guide. In both cases these castings are set at 6-ft. intervals, providing anchorage for guides accordingly. The guides measure 5½x7½ in. and are of pine throughout.

## Close Propping and Small Falls Save Timber

BY R. W. LIGHTBURN  
Gans, Pa.

Posting in the mines should be done according to system. For instance, if 4 ft. is the desirable distance between props in somewhat bad roof, props should be set 4 ft. apart and in line across the rib, that is, being drawn regardless of the roof being good or bad.

The miner may object to setting these posts, arguing that he can mine all the coal under the coming area of fall with less posts than he is asked to set. Perhaps he can, but there is another party at interest, the man who has to draw the posts. His safety depends on as few posts as possible being bent or broken under the pressure of the roof.

The purpose of the posts is to steady as far as possible that part of the roof over the area extracted and not yet caved. They must be sufficiently numerous to prevent the roof from becoming broken or cracked. They must retain in the roof its inherent strength. If too few are used the roof will be fractured and the posts will be under too heavy a burden. Should they break

down, not only will the posts be lost but also several tons of coal.

Falls should be kept within proper dimensions. The area allowed for a single fall should be about 16x24 ft. It will have about four rows of props and extend for a width equal to the combined width of room and pillar. Where the falls are kept to such a dimension the posts do not have to stand in place long and are not subjected to inordinate pressure and so can be used over and over again.

Only persons of experience should remove timber. Such a man will have an established method of removing difficult props. Some of the posts may have sunk into the cap-piece and to recover them extra posts must be set so that the man who is doing the work can be in the line of greatest safety and in the most favorable position for the recovery of posts.

If the bottom is hard and much slate has been thrown back among the posts so that it is difficult to get at the post bottom to loosen it, a slanting cut should be made in the post near the cap-piece with a sharp axe and on the outbye side of the post. A post puller should then be attached, and then with the exercise of a little force the post will come out.

I would advocate that the man who must recover timber be the man to place it. If a rib boss were given a section of suitable size he could do both satisfactorily.

To draw posts the timberman should have an axe with a hammer on one face. It should have a handle 4 ft. long. He also should have a punching post with a 6-ft. iron handle and fitted with a light pick-shaped head which can be stuck into a post that has been knocked down so that the post can be drawn to a point where it can be removed by hand. This punch post is useful in recovering crossbars. To get the best results specially designed tools for all purposes should be used.

## Urge Early Coal Loading

Shippers of coal in northern West Virginia have been asked by railroad companies operating in that part of the state to load as much of their coal as possible during the first three days of the week, if it can be done without prejudicing the business of shippers. This request is made in order that the roads may be in a position to clean up business on Friday and Saturday of each week and is part of a program of increased economy in connection with the handling of traffic.

## Discussion

### How to Prevent Gas from Causing Explosions

BY GEORGE EDWARDS  
Pikeville, Ky.

Recent mine explosions have awakened a new interest in the means of preventing such catastrophes. To handle a mine generating explosive gas is a job for a man who has been trained in the work as it were from the cradle up and should not be placed in the hands of any other. When considering a foreman's experience everything depends on where that experience was obtained, under what management he has worked and how long he was able to stay. Some companies are proud of the fact that they train their own men, and that is without question the best plan to adopt, but if they have been operating nongaseous mines and then encounter explosive gas, they should break that rule and go out of the organization for an experienced man to take charge of the job.

When gas is found, no matter how little, thorough plans should be made to provide for every eventuality and every opportunity should be taken to discourage disregard and indifference to small accumulations of gas. The tendency of the average boss who is not familiar with gas is to pretend to be wise and abundantly able to take care of the situation. Such men may be found lighting the gas for the fun of seeing it burn, until at last some man lights a trace, as he has often done before, and finds more gas than he expected and becomes to his surprise a badly burned man or something worse.

#### WISE FOREMAN PLAYS SAFE

The foreman who is familiar with gas will not allow the bosses or the workmen to do anything foolish, for he has learned that an ounce of prevention is worth a pound of cure and you will find him getting ample ventilation up to the working faces, which means that all stoppings and overcasts are well built and that no crosscuts are allowed to remain open but are promptly stopped with masonry stoppings.

Doors usually are necessary in the advanced workings, but the strictest kind of regulation should be enforced in having them built so that they will close automatically and everyone in the mine should be made understand that leaving a door open is a serious offense. The night shift usually is the hardest to control, and among the worst to leave doors open and damage other equipment are the undercutters and their helpers. The night foreman in a mine generating explosive gas should be thoroughly capable.

It is a good rule to have the firebosses register in, to insure that they are taking all the time necessary to

cover their section carefully. If this is done you will have no late starters, and if a fireboss should fail to report for duty, whoever is in charge will be able to make provision for his replacement. The firebosses should examine all doors and see that the ventilation is traveling in its proper courses both on Sundays and holidays.

Looking back over my experience with firebosses, I cannot forget that they often are young men who are just starting on their first responsible job, and for this reason they should be rigidly disciplined. I have found them in most cases familiar with the work they are supposed to do, but they fail in most instances because they are not willing to do the work as it should be done. A fireboss examining a mine with extensive pillar work has a hard job before him, especially in thin coal.

The foreman in charge should devote his entire time to the inside workings and he should be in constant command of all operations from beginning to end. The "sunshine foreman" should be eliminated from the gaseous mine.

### Denies Undue Delay in Rescue Work at Hunt Mine Fire

In *Coal Age* of Nov. 15 there is a note with regard to the fire at the Hunt Mine, near Staunton, Ind., in the course of which there is an implied criticism of the delay of men from the Vincennes station of the Bureau of Mines reaching the fire. The facts are as below:

The notice of the fire reached the Vincennes station at 10 a.m. The foreman left at once for Staunton in a small truck belonging to the station and arrived at the mine, 80 miles distant, in two hours and thirty minutes. At the time the call came in some minor repairs were being made on the big truck, so that it was nearly 11 o'clock before it was ready to start. The first-aid miner driving it covered the 80 miles in 4 hours and 30 minutes, arriving at 3:30 p.m. This is good time for a large truck heavily loaded with equipment, and one designed to travel 20 miles an hour.

When the foreman arrived at 12:30 p.m., flames were pouring out from the mine and it would have been impossible to enter it even if apparatus had been at hand, but he helped the fire companies from Brazil and Terre Haute, who by that time had a fire engine pumping water from a pond a quarter of a mile distant and were throwing a good stream of water on the fire.

At 3:30 p.m., when the apparatus arrived, the fire was about extinguished. Word was sent down the slope to the foreman, who in company with Mike Scollard, former chief mine

inspector, and William Morwood, inspector for the Associated Companies, immediately came out and commenced to assemble the apparatus. This required about twenty-five minutes. Just as they completed this and started for the mine opening, word came out that the firemen had gone on into the mine without equipment and were bringing out a body. The foreman and the two men above mentioned then went into the mine and brought out the fourth and last body. The firemen who rushed into the mine without apparatus were, of course, running a great and probably unwarranted danger of being overcome by carbon monoxide, and in fact they were nearly overcome.

It can hardly be expected that the federal government will be able to maintain rescue and fire-fighting crews in such numbers as to permit their reaching each mine in less time than was taken in this case. In fact, the time might well have been longer, since it is the duty of the men of the mine safety service to devote the greater part of their time to training at the mines, and it is only by chance that they are actually at their headquarters at any given moment. When the Mine Safety Service was established it was more with a thought of demonstrating methods and training men than to relieving the industry of all of the work of first aid, rescue and fire fighting.

Whenever and wherever the men of the service are available they are instructed to proceed promptly to the scene of the disaster and to render any aid possible, but the major responsibility of meeting any emergencies must always rest on the industry itself and the state officials. Since the federal government has no police power in the states the federal men could never proceed except by consent, and they must always be the assistants of the state inspectors under such circumstances rather than an independent and all comprehensive force.

In a number of mining districts the operators, realizing the necessity of having a twenty-four hour local service, have combined to support local mine safety stations and crews. That at Globe, Ariz., is well known. The Coeur d'Alene operators this year established such a station and have found it very useful in fighting mine fires. The Bureau of Mines will always give all of the service that it can, but it must not be expected to give complete and continuous protection to each individual district. To do so would require an appropriation of funds far beyond any that might properly be suggested to Congress.

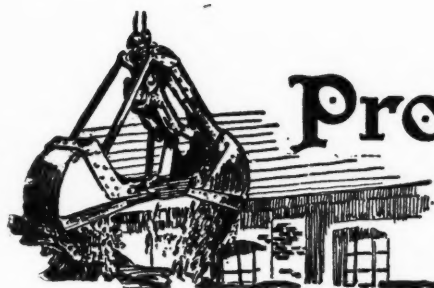
H. FOSTER BAIN,  
Director, U. S. Bureau of Mines.

### Know Any Queer Ones?

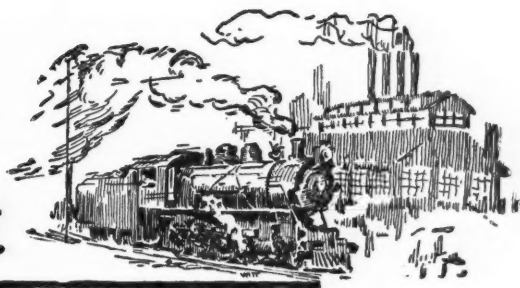
A correspondent writes: "Why not have a letter competition to see who can report the oddest named coal mine? For instance, 'Struggling Monkey,' mine near Terre Haute, Ind."

The lists are open.





# Production and the Market



## Weekly Review

Present indications are that the year 1923 will close with the fourth largest production of bituminous coal on record. With two weeks to go, the output to Dec. 15 was 526,489,000 tons and the year's figure will be over 540,000,000 net tons. Three years—1917, 1918 and 1920—have exceeded this figure. Anthracite production, on the other hand, promises to set a new high record for fresh-mined coal. The total output for the year will be around 95,000,000 net tons, exceeded only by the war years, 1917 and 1918. The washery production in those years was very large, however, and has been correspondingly small this year. Therefore the final figures may show a new record for fresh-mined anthracite. This has been the most prosperous year ever enjoyed by the hard-coal industry, despite the strike of September.

The end of the calendar year has no especial significance to the coal trade save that as the miners will take several days for the holiday there will be a cleaning up of "no bills" at the mines, to be followed by brisker trading after the new year begins. The only feature of the past week has been the pick-up in screenings, not due to any increase in demand but to scarcity of fine coal. The operators, rebelling at the absurdly low quotations on screenings in the Middle West, shifted to mine-run, the demand for lump being at low ebb. A period of severe weather will call forth lump in quantity and screenings will again be plentiful, and cheaper than ever.

### Stocks Allay Uneasiness About April 1

There is no change in the steam-coal market in the Eastern section of the country. New England is flat as far as all-rail Pennsylvania soft coal is concerned; the smokeless coals coming in by water have driven them off the spot market. Stocks of soft coal are so generally satisfactory that no strong currents in the price are looked for, even should there be definite indications of a strike next April.

Coal Age index of spot prices of bituminous coal at the mines declined three points last week to 178. The corresponding average price was \$2.16. Increases in price were recorded by central Illinois, Indiana, and Smokeless. Southern and Eastern coals all recorded slight declines in price.

Production of beehive coke for the year will fall short of 17,000,000 net tons. Although more than twice the output in either 1921 or 1922, this figure is below previous years; less even than in 1919, when the steel industry was at low ebb.

Quotations on independent anthracite are slowly receding. The market stands at \$11 for stove and nut. The steam sizes are weak, except No. 3 buckwheat, which has largely been tied up on contracts. Nothing but a spell of real cold weather can save the premium prices from a new year slump.

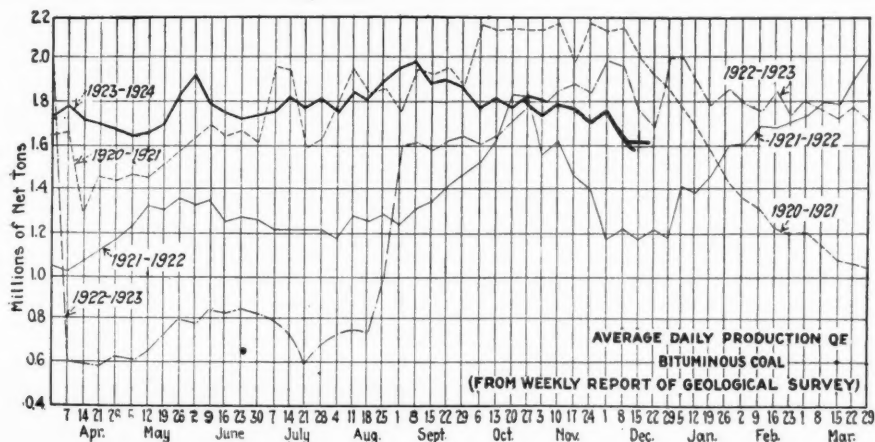
Lake movement of soft coal during the week ended Dec. 16 amounted to 48,567 net tons, of which 46,204 tons was cargo coal. In the corresponding week of last year 53,086 tons was dumped. Cumulative shipments of cargo coal during this season to Dec. 16 were 29,724,320 net tons, an increase of more than 41 per cent over the average of the three preceding years.

Dumpings at Hampton Roads for all accounts during the week ended Dec. 20 were 355,927 net tons, as compared with 283,168 tons the previous week.

### Midwest Markets Are Slow

Nothing has happened during the past week to stiffen up the weak and sagging markets in the Middle West. Domestic demand is just as soft as the weather. Lump, produced in small volume because of the proportion of shutdowns in the Western fields, is filling the light demand and there is no immediate indication of any improvement in price because of the potential production all ready to burst loose with the first cold wave.

The domestic market is pretty well saturated with Pocahontas lump and egg at \$3.50@\$3.75 and with mine-run at \$2, so that the flow of that and other high-grade Eastern



### Estimates of Production

(Net Tons)

BITUMINOUS		
	1922	1923
Dec. 1	10,387,000	8,943,000
Dec. 8 (a)	11,495,000	9,829,000
Dec. 15 (b)	10,667,000	9,828,000
Daily average	1,778,000	1,638,000
Calendar year	387,599,000	526,489,000
Daily av. cal. year	1,311,000	1,786,000
ANTHRACITE		
Dec. 1	1,852,000	1,748,000
Dec. 8	2,075,000	1,899,000
Dec. 15	2,237,000	2,013,000
Calendar year	51,030,000	91,971,000
COKE		
Dec. 8 (b)	291,000	265,000
Dec. 15 (a)	299,000	242,000
Calendar year	7,489,000	17,443,000

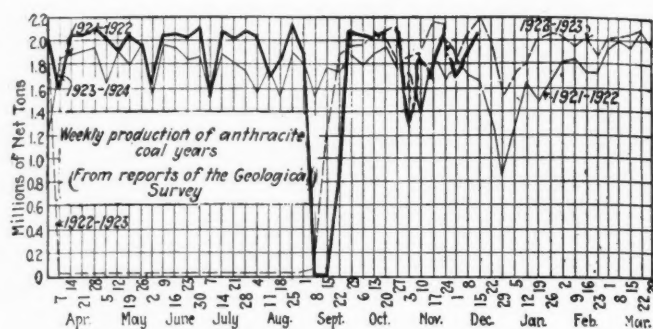
(a) Subject to revision. (b) Revised from last report.

coals into the Middle West runs along lightly. Anthracite is in no keen demand by householders. The large sizes are stocked in volume by retailers and even chestnut is now on hand in sufficient quantity to meet all needs.

Steam coals show the only signs of life and these are selling readily only because of the slim output.

It is a rather "blue" Christmas in the Carterville field of Williamson and Franklin County for most miners. Many mines have been idle for many weeks. Others are working one and two days a week and very few of them are getting more than half time at best. Railroad tonnage has eased up and the only thing for which there is any great demand seems to be screenings and small nut. All mines have domestic sizes unbilled. Movement is good and plenty of empties are in sight. There is a general feeling of dissatisfaction among the miners throughout the entire field.

The Franklin County operators are trying to maintain their circular, but this is being cut and the independents are selling lump and egg as low as \$3, with nut at \$2.75, in an effort to keep things going. Railroad tonnage in the DuQuoin field is practically stopped. In the Mt. Olive district steam seems to be in good demand, but it is diffi-



cult to move domestic sizes. This field continues to take \$3@3.25 for domestic sizes, which dealers seem to think too high. Mines in this field are getting from one to two days a week. Railroad tonnage is good. In the Standard field screenings are in good demand and 2-in. lump fairly active, with a ready call for steam nut, while egg and 6-in. lump are slow.

### Current Quotations—Spot Prices, Bituminous Coal—Net Tons, F.O.B. Mines

Low-Volatile, Eastern				Midwest			
Market	Quoted	Dec. 26 1922	Dec. 10 1923	Market	Quoted	Dec. 26 1922	Dec. 10 1923
Smokeless lump.....	Columbus.....	\$6.30	\$3.75	Franklin, Ill. lump.....	Chicago.....	\$5.35	\$3.60
Smokeless mine run.....	Columbus.....	6.00	2.10	Franklin, Ill. mine run.....	Chicago.....	4.10	2.35
Smokeless screenings.....	Columbus.....	5.50	1.25	Franklin, Ill. screenings.....	Chicago.....	3.10	1.70
Smokeless lump.....	Chicago.....	7.75	3.35	Central, Ill. lump.....	Chicago.....	4.35	3.00
Smokeless mine run.....	Chicago.....	6.60	1.75	Central, Ill. mine run.....	Chicago.....	3.10	2.10
Smokeless lump.....	Cincinnati.....	6.75	3.50	Central, Ill. screenings.....	Chicago.....	2.20	1.45
Smokeless mine run.....	Cincinnati.....	6.25	2.00	Ind. 4th Vein lump.....	Chicago.....	5.10	3.25
Smokeless screenings.....	Cincinnati.....	6.10	1.50	Ind. 4th Vein mine run.....	Chicago.....	3.85	2.60
*Smokeless mine run.....	Boston.....	8.60	4.50	Ind. 4th Vein screenings.....	Chicago.....	2.35	1.65
Clearfield mine run.....	Boston.....	4.25	1.85	Ind. 5th Vein lump.....	Chicago.....	4.75	2.50
Cambria mine run.....	Boston.....	4.80	2.35	Ind. 5th Vein mine run.....	Chicago.....	3.60	2.10
Somerset mine run.....	Boston.....	4.40	2.10	Ind. 5th Vein screenings.....	Chicago.....	2.35	1.45
Pool 1 (Navy Standard).....	New York.....	6.25	3.00	Mt. Olive lump.....	St. Louis.....	3.00	3.10
Pool 1 (Navy Standard).....	Philadelphia.....	5.50	3.00	Mt. Olive mine run.....	St. Louis.....	2.25	2.50
Pool 1 (Navy Standard).....	Baltimore.....	6.00		Mt. Olive screenings.....	St. Louis.....	1.55	1.75
Pool 9 (Super. Low Vol.).....	New York.....	5.35	2.25	Standard lump.....	St. Louis.....	4.25	2.85
Pool 9 (Super. Low Vol.).....	Philadelphia.....	5.30	2.35	Standard mine run.....	St. Louis.....	2.10	2.05
Pool 9 (Super. Low Vol.).....	Baltimore.....	5.10	2.25	Standard screenings.....	St. Louis.....	1.50	1.15
Pool 10 (H.Gr. Low Vol.).....	New York.....	5.10	1.95	West Ky. lump.....	Louisville.....	4.35	3.00
Pool 10 (H.Gr. Low Vol.).....	Philadelphia.....	4.85	1.85	West Ky. mine run.....	Louisville.....	3.35	1.70
Pool 10 (H.Gr. Low Vol.).....	Baltimore.....	4.60	2.20	West Ky. screenings.....	Louisville.....	2.50	1.00
Pool 11 (Low Vol.).....	New York.....	4.15	1.80	West Ky. lump.....	Chicago.....	4.25	2.85
Pool 11 (Low Vol.).....	Philadelphia.....	4.45	1.65	West Ky. mine run.....	Chicago.....	2.75	1.75
Pool 11 (Low Vol.).....	Baltimore.....	4.10	1.90				
High-Volatile, Eastern				South and Southwest			
Pool 54-64 (Gas and St.).....	New York.....	3.55	1.60	Big Seam lump.....	Birmingham.....	3.95	3.85
Pool 54-64 (Gas and St.).....	Philadelphia.....		1.60	Big Seam mine run.....	Birmingham.....	2.60	1.95
Pool 54-64 (Gas and St.).....	Baltimore.....	3.85	1.85	Big Seam (washed).....	Birmingham.....	2.60	2.35
Pittsburgh so'd gas.....	Pittsburgh.....	5.25	2.55	S. E. Ky. lump.....	Chicago.....	6.25	3.10
Pittsburgh gas mine run.....	Pittsburgh.....		2.25	S. E. Ky. mine run.....	Chicago.....	3.85	1.85
Pittsburgh mine run (St.).....	Pittsburgh.....	3.10	2.05	S. E. Ky. lump.....	Louisville.....	6.75	3.35
Pittsburgh slack (Gas).....	Pittsburgh.....	3.00	1.50	S. E. Ky. mine run.....	Louisville.....	3.50	1.75
Kanawha lump.....	Columbus.....	5.25	3.00	S. E. Ky. screenings.....	Louisville.....	3.10	1.75
Kanawha mine run.....	Columbus.....	3.10	1.85	S. E. Ky. lump.....	Cincinnati.....	6.50	3.10
Kanawha screenings.....	Columbus.....	2.85	.80	S. E. Ky. mine run.....	Cincinnati.....	3.35	1.55
W. Va. lump.....	Cincinnati.....	6.25	2.85	S. E. Ky. screenings.....	Cincinnati.....	3.25	.95
W. Va. Gas mine run.....	Cincinnati.....	3.75	1.60	Kansas lump.....	Kansas City.....	5.50	4.75
W. Va. Steam mine run.....	Cincinnati.....	3.35	1.60	Kansas mine run.....	Kansas City.....	3.75	3.25
W. Va. screenings.....	Cincinnati.....	3.10	.85	Kansas screenings.....	Kansas City.....	2.50	2.00
Hooking lump.....	Columbus.....	5.25	2.95				
Hooking mine run.....	Columbus.....	2.85	1.85				
Hooking screenings.....	Columbus.....	2.60	1.05				
Pitta. No. 8 lump.....	Cleveland.....	4.75	2.45				
Pitta. No. 8 mine run.....	Cleveland.....	3.25	1.95				
Pitta. No. 8 screenings.....	Cleveland.....	3.10	1.35				

\* Gross tons, f.o.b. vessel, Hampton Roads.

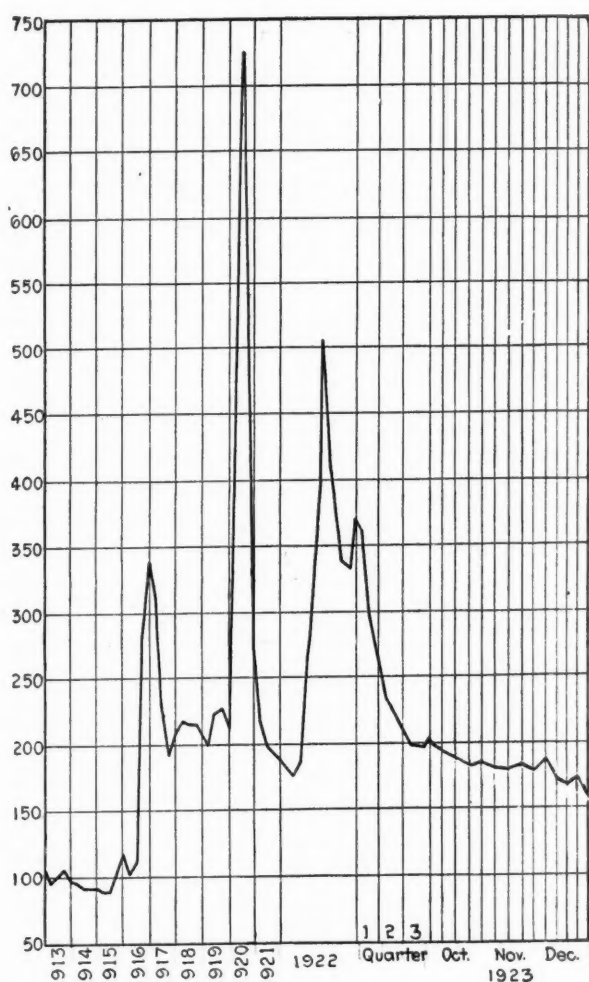
† Advances over previous week shown in heavy type, declines in *italics*.

### Current Quotations—Spot Prices, Anthracite—Gross Tons, F.O.B. Mines

Market		Dec. 26, 1922		Dec. 17, 1923		Dec. 24, 1923†	
Quoted	Freight Rates	Independent	Company	Independent	Company	Independent	Company
Broken.....	New York.....	\$2.34	\$9.00	\$7.75@8.25	\$8.50@10.00	\$8.50@10.00	\$8.00@9.25
Broken.....	Philadelphia.....	2.39		7.90@8.10			
Egg.....	New York.....	2.34	9.25@12.00	8.00@8.35	9.85@10.50	9.85@10.50	8.75@9.25
Egg.....	Philadelphia.....	2.39	9.25@11.00	8.10@8.35	9.85@12.20	9.85@12.20	8.75@9.25
Egg.....	Chicago.....	5.06	12.50@13.00	7.20@8.25	9.60@12.50	9.60@11.50	8.00@8.35
Stove.....	New York.....	2.34	9.25@12.00	8.00@8.35	9.85@11.00	9.85@11.00	8.75@9.25
Stove.....	Philadelphia.....	2.39	9.25@11.00	8.15@8.35	9.85@12.20	9.85@12.20	8.90@9.25
Stove.....	Chicago.....	5.06	12.50@13.00	7.35@8.25	9.60@12.50	9.60@12.50	8.00@8.35
Chestnut.....	New York.....	2.34	9.25@12.00	8.00@8.35	9.85@11.00	9.85@11.00	8.75@9.25
Chestnut.....	Philadelphia.....	2.39	9.25@11.00	8.15@8.35	9.85@12.20	9.85@12.20	8.90@9.25
Chestnut.....	Chicago.....	5.06	12.50@13.00	7.35@8.35	9.60@12.50	9.60@12.50	8.00@8.35
Range.....	New York.....	2.34		8.25		9.00	
Pen.....	New York.....	2.22	7.00@11.00	6.15@6.30	6.00@7.25	6.00@6.50	6.15@6.65
Pen.....	Philadelphia.....	2.14	7.00@8.00	6.15@6.20	6.35@7.50	6.35@7.50	6.35@6.60
Pen.....	Chicago.....	4.79	7.00@8.00	5.49@6.03	6.00@6.75	6.00@6.75	5.40@6.05
Buckwheat No. 1.....	New York.....	2.22	4.00@5.00	4.00@4.10	2.00@3.00	2.00@3.00	3.50
Buckwheat No. 1.....	Philadelphia.....	2.14	5.00	4.00	2.25@3.50	2.25@3.50	3.60
Rice.....	New York.....	2.22	3.00@3.25	2.75@3.00	1.35@2.25	1.35@2.25	2.50
Rice.....	Philadelphia.....	2.14	2.50@2.75	2.75@3.00	1.75@2.50	1.75@2.50	2.50
Barley.....	New York.....	2.22	1.75@2.00	1.50@2.00	1.25@1.50	1.00@1.50	1.50
Barley.....	Philadelphia.....	2.14	1.00@1.75	2.00	1.00@1.50	1.00@1.50	1.50
Birdseye.....	New York.....	2.22		2.10	1.25@1.45	1.25@1.45	1.60

\* Net tons, f.o.b. mines. † Advances over previous week shown in heavy type, declines in *italics*.





Coal Age Index of Spot Prices Bituminous Coal F.O.B. Mines

	1923			1922
	Dec. 24	Dec. 17	Dec. 10	Dec. 26
Index .....	178	181	180	349
Weighted average price .....	\$2.16	\$2.19	\$2.18	\$4.23

This diagram shows the relative, not the actual, prices on fourteen coals, representative of nearly 90 per cent of the bituminous output of the United States weighted first with respect to the proportions each of slack, prepared and run-of-mine normally shipped, and second, with respect to the tonnage of each normally produced. The average thus obtained was compared with the average for the twelve months ended June, 1914, as 100, after the manner adopted in the report on "Prices of Coal and Coke, 1913, 1918," published by the Geological Survey and the War Industries Board.

### St. Louis Market Easy

Mild weather has brought about an easy market in St. Louis with very little domestic tonnage moving and that only of the cheaper grades. Country demand has practically ceased. Wagonload steam locally is fairly active and carload for nut and screenings good, with some nut moving to Chicago and the Northwest.

Although trade is low all over Kentucky, even in the Eastern non-union fields where wages have been reduced in some instances to get business, there is hope springing eternal in the Kentucky breast. The fact of low production, however, strengthened screenings in both ends of the state. There is very little business other than steam just now, but almost everyone sees something ahead.

### Northwest Awaits Winter

Mild weather is still holding the market at low ebb at Duluth, Minneapolis and Milwaukee. The selling competition between rails, lakes and lignite from Dakota continues to be keen and to hide any sign of interest on the part of buyers.

Demand at Duluth for soft coal is off. In fact dock men report that this year is the dullest in several years. It is expected, however, that many of the mines on the iron range will be in the market immediately after Jan. 1, as water power is short, and they will need coal to operate. The only demand at present is from public utilities and power plants

which have been supplying water power. The market is generally firmer. Dock men feel that the buying streak must come and are sitting tight.

### West Also Somnolent

Nothing disturbed the painful peace of Western coal markets during the week. Steam coal is generally in good demand with small supply but domestic supply more than meets all the needs. In Utah operators are getting from \$1 to \$2 less at the mines for all sizes of coal than they did a year ago.

### Ohio Markets Demand Slack

Slack, screenings and small sizes hold the attention of the Cincinnati market. Low-volatile screenings are beginning to be demanded by the by-product trade. The extreme weakness of the market is shown in lump, particularly smokeless lump. Retail business was in a trifle better shape due to a snow flurry but soon fell back into the old rut. Outside of the small sizes, which are showing strength, the trade at Columbus is dull. Buying of steam and domestic sizes is limited, owing to heavy reserves in the bins and yards of dealers.

The Cleveland market, like all others, was affected by the holiday season. The steam trade is quiet, inquiries are few and but little activity is expected before Jan. 1.

The Pittsburgh coal market grew poorer last week both as to prices and as to the difficulty in making sales. Demand for spot coal is light, and but few consumers with contracts appear to be able to take extra tonnage. It is quite impossible to interest anyone in stocking coal against a possible suspension on April 1.

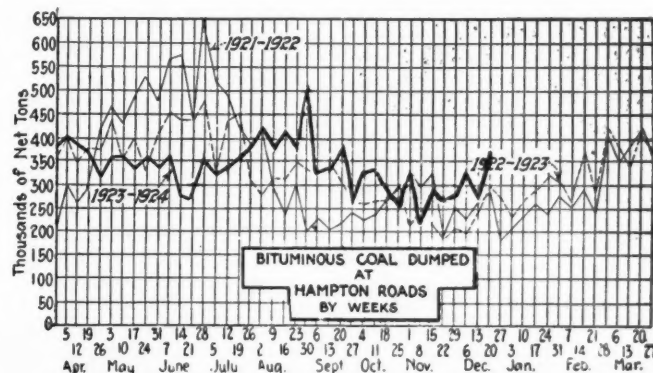
### New England Buyers Show No Interest

On steam coal in New England there are few developments. Buyers show no interest in the current market, and now that there is less coal being forced on the market there is a pronounced lull throughout the trade.

At Hampton Roads the amount of coal standing has been steadily cut down and as fast as the tonnage is moved there is less and less being sent from the mines to replace it. A few agencies are even buying spot coal to make good on commitments, and, as might be expected in a situation of this character prices are up slightly although the upgrade movement is extremely slow.

### Tidewater Demand Slow

Weather conditions reduced consumption and affected the soft-coal market along the Atlantic seaboard. Demand was slow at all tidewater markets, due to both weather and the efforts of nearly all consumers to avoid adding to their supplies until after New Year's. At New York there has been some inquiry regarding contracts for next year, some of which expire early in January, but the matter of price is difficult to arrive at. The Philadelphia market continues dull and lifeless. There is no buying of any consequence and consumers do not appear to be anxious as to increasing their reserves. Baltimore reports that except for the demand for slack from the cement industry there is no sign of encouragement in that market. The Birmingham market continues slow and draggy. Steam coal is difficult to move and domestic grades move slowly. The trade, it is asserted is at about the dullest point of the year.



### Anthracite Market Not Active

There is no great activity in the anthracite market. Demand for the various domestic coals is sectional, stove being in demand in some, while in others chestnut appears to be the most difficult to obtain. At New York cancellations of high-priced coals are being received by some shippers, while the general run of quotations for stove and chestnut appears to be around \$11. Egg coal was quoted as high as \$10.50. Retail dealers are not inclined to buy premium coal unless it is absolutely necessary. Philadelphia retail dealers are not rushed for deliveries, most of them having some supplies on hand to meet all requirements. Egg and pea is hard to move by producers and in some instances they find it necessary to insist upon buyers taking some of these sizes

with the preferred coals. There is no activity in the Baltimore anthracite market. The steam-coal market is dull and these coals are accumulating, although barley is in better shape than either buckwheat or rice.

### Car Loadings, Surplusages and Shortages

	Cars Loaded	
	All Cars	Coal Cars
Week ended Dec. 8, 1923.....	913,774	173,156
Previous week.....	835,296	156,608
Same week in 1922.....	909,174	197,818

	Surplus Cars		Car Shortage	
Dec. 7, 1923.....	197,128	104,245		
Same date in 1922.....	6,657	2,352		
Nov. 30, 1923.....	153,057	80,756	1,336	605

## Foreign Market And Export News

### British Coal Output Gains

Production of British coal increased 10,000 tons during the week ended Dec. 8, output amounting to 5,729,000 tons, according to a cable to *Coal Age*. The output for the previous week was 5,719,000 tons, while for the corresponding week of last year it was 5,592,000 tons.

A sustained demand for almost all classes of coal maintains the activity of the Welsh coal market. There is a steady pressure for supplies for the balance of this year and over the first half of January. Most of the big mines are sold ahead, and new business probably will be done at higher prices. European business is increasing, especially with France, Belgium, Italy and Holland. The demand from Germany is slow. Business with other countries, including South America, is steady.

The only disturbing factor in the Welsh market is caused by the refusal of the trimmers to work the third shift at the ports. This refusal was a handicap, especially at Cardiff, it having come at a most inopportune time on account of the full order books of most of the mines.

The Newcastle market remains steady except that the return of stormy weather has delayed shipping. As a result there has been some prompt coal on the market and lower prices have been accepted. There is inquiry from Scandinavia and Germany, and France and Italy are also showing a disposition to do business. Operators are quoting current prices up to the end of March.

### French Coal Market Dull

Demand for the French industrial coals is quiet, but movement of house coals is more active. Immediate needs are being covered, but with the cheapest grades. Anthracite and semi-bituminous are dull.

Imports of British coals are lower, buyers refusing to pay the high prices quoted as a consequence of the rise in sterling. Orders, close to 100,000 tons, have been placed in Cardiff by some of the French railways at prices of 26s. 6d. for large Admiralty second and 18s. 6d. for steam smalls, according to grades, for delivery during 1924.

### Export Clearances, Week Ended Dec. 22, 1923

FROM HAMPTON ROADS	
For Dominican Republic:	Tons
Du. SS. Ary, for Puerto Plata.....	6,227
For New Zealand:	
Br. SS. City of Dunedin, for Auckland.....	1,417
For West Indies:	
Nor. SS. Tela, for Fort de France....	4,395
For Cuba:	
Amer. Schr. Snetind, for Cienfuegos..	2,260
Nor. SS. Krosfond, for Havana.....	2,678
For Halifax:	
Br. Schr. David C. Ritey.....	443
For Italy:	
Ital. SS. Emanuele Accame, for Genoa.....	11,100

FROM BALTIMORE	
For Cuba:	
Am. SS. Elizabeth.....	4,698

FROM PHILADELPHIA	
For Cuba:	
Am. SS. Lillian.....	—

### Hampton Roads Market Weak

Business, generally, was duller at Hampton Roads last week because of the holiday season. The market was weak, but movement of coal held its own. Foreign movement showed a slight increase, while inquiries for export coals were somewhat brisk.

Coastwise trade was slow, but bunkers was good, and supplies of coal at tidewater increased. Ill effects of the Virginian Ry. strike, which threatened to tie up coal movement on that road, were being eliminated, and the Sewalls Point piers received almost normal coal supplies.

Domestic business showed little improvement, and prices at retail were weakening. Ten dollars a ton was the maximum for best grades of soft coal at retail, while prepared coal were selling one dollar higher.

### Hampton Roads Pier Situation

N. & W. piers, Lamberts Pt.:		Dec. 13	Dec. 20
Cars on hand.....		2,200	2,142
Tons on hand.....		125,575	124,317
Tons dumped for week.....		108,643	132,439
Tonnage waiting.....		12,000	10,000

Virginian Ry. piers, Sewalls Pt.:		Dec. 13	Dec. 20
Cars on hand.....		1,244	1,092
Tons on hand.....		73,950	66,450
Tons dumped for week.....		65,493	79,742
Tonnage waiting.....		1,040	4,500

C. & O. piers, Newport News:		Dec. 13	Dec. 20
Cars on hand.....		1,560	1,417
Tons on hand.....		78,515	71,740
Tons dumped for week.....		78,693	105,611
Tonnage waiting.....		690	6,315

### Pier and Bunker Prices, Gross Tons

PIERS		Dec. 15	Dec. 22†
Pool 9, New York.....	\$5.00 @ \$5.25	\$5.00 @ \$5.25	\$5.00 @ \$5.25
Pool 10, New York.....	4.75 @ 5.00	4.75 @ 5.00	4.75 @ 5.00
Pool 11, New York.....	4.50 @ 4.80	4.50 @ 4.80	4.50 @ 4.80
Pool 9, Philadelphia.....	4.90 @ 5.20	4.90 @ 5.20	4.90 @ 5.20
Pool 10, Philadelphia.....	4.50 @ 4.90	4.50 @ 4.90	4.50 @ 4.90
Pool 11, Philadelphia.....	4.25 @ 4.60	4.25 @ 4.60	4.25 @ 4.60
Pool 1, Hamp. Roads.....	4.50	4.50 @ 4.60	4.50 @ 4.60
Pools 5-6-7 Hamp. Rds.....	4.15 @ 4.30	4.10 @ 4.25	4.10 @ 4.25
Pool 2, Hamp. Roads.....	4.25	4.25 @ 4.35	4.25 @ 4.35

BUNKERS		Dec. 15	Dec. 22†
Pool 9, New York.....	5.30 @ 5.55	5.30 @ 5.55	5.30 @ 5.55
Pool 10, New York.....	5.05 @ 5.30	5.05 @ 5.30	5.05 @ 5.30
Pool 11, New York.....	4.80 @ 5.15	4.80 @ 5.15	4.80 @ 5.15
Pool 9, Philadelphia.....	5.15 @ 5.55	5.15 @ 5.55	5.15 @ 5.55
Pool 10, Philadelphia.....	4.90 @ 5.20	4.90 @ 5.20	4.90 @ 5.20
Pool 11, Philadelphia.....	4.65 @ 4.90	4.65 @ 4.90	4.65 @ 4.90
Pool 1, Hamp. Roads.....	4.50	4.50 @ 4.60	4.50 @ 4.60
Pool 2, Hamp. Roads.....	4.25	4.25 @ 4.35	4.25 @ 4.35

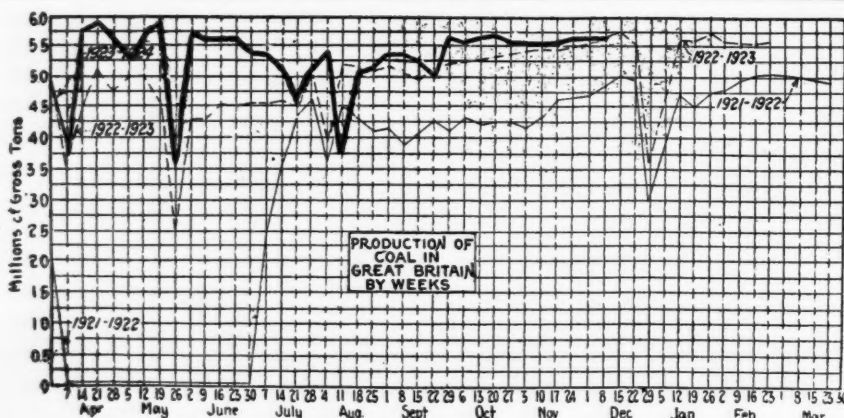
### Current Quotations British Coal f.o.b. Port, Gross Tons

Quotations, by Cable to Coal Age		Dec. 15	Dec. 22†
Admiralty, large.....	29s. 6d. @ 30s.	29s. @ 30s.	29s. @ 30s.
Steam smalls.....	22s. 6d. @ 25s.	21s. @ 22s.	21s. @ 22s.

Newcastle:		Dec. 15	Dec. 22†
Best steams.....	26s. 6d.	24s. 3d. @ 25s. 8d.	24s. @ 25s.
Best gas.....	24s. @ 24s. 6d.	23s. @ 24s.	23s. @ 24s.
Best bunkers.....	23s. @ 24s.	22s. @ 23s.	22s. @ 23s.

† Advances over previous week shown in heavy type, declines in italics.





## Traffic News

### Postponed Again

Another postponement of the effective date of the assigned car order has been made by the Interstate Commerce Commission until April 1, 1924. This is the sixth postponement, the commission's decision originally having been scheduled to go into effect Sept. 1, 1923.

### Lehigh Would Control D. S. & S.

The Lehigh Valley R.R. Co. on Dec. 17 made application to the Interstate Commerce Commission for authority to acquire control of the Delaware, Susquehanna and Schuylkill R.R. by lease or ownership of its capital stock. The D. S. & S. has been used in the past for coal carrying only. It is a short line established by Cox Brothers & Co. and is situated in the Hazleton district.

### Install 9,179 Coal Cars

Of a total of 21,973 new freight cars installed in service during November, 9,179 were coal cars, according to the Car Service Division of the American Railway Association. From Jan. 1 to Dec. 1 177,845 new freight cars and 3,704 new locomotives have been installed by the railroads.

### Balk at Higher Hard-Coal Rate

C. A. Bruce, secretary of the Twin City Coal Exchange, announced on Dec. 11 that the exchange will file a formal protest against the proposed increase in through rail rates on anthracite from the principal Pennsylvania mines to Minneapolis and other Northwestern points. The freight rate on anthracite, if changed, will mean an increased transportation cost of \$1.66 on a net ton of hard coal, Mr. Bruce said. Several other Northwestern organizations are planning to protest the proposed rail rate, according to Mr. Bruce.

## Obituary

**Benjamin F. Tarr**, aged 78, a Civil War veteran, who is said to have erected the first coal tippie in Pennsylvania and also to have sunk the first double coal shaft in the state, died Nov. 30 in his home in Verona, Pa. He had been connected with various gas and coal operations until his retirement, eleven years ago.

**Angus A. Ferguson**, 56 years old, a well-known mining man in Nova Scotia, former manager of Florence colliery, later coal inspector for Scotia, and mining instructor died at Sydney Mines on Dec. 10.

**Henry S. Hastings**, of St. Marys, Pa., receiver of the Pittsburgh, Shawmut & Northern R.R. and the mortgaged properties of the Shawmut Mining Co. and the Kersey Mining Co., died at New Haven, Conn., Dec. 13, while visiting his son, who is a student at Yale University. At the time of his death Mr. Hastings was President of the Shawmut Mining Co., the Kersey Mining Co., the Shawmut Coal & Coke Co., the Shawmut Commercial Co., Clarion River Ry., Kersey R.R. Co., the Shawmut Holding Corporation of New York State, Shawmut Realty Corporation of Pennsylvania, and treasurer of the Byrnedale Coal Co. He was 58 years old.

**Ralph E. Gilman**, special engineer in charge of turbo-generator engineering of the Westinghouse Electric & Manufacturing Co., died in the Methodist Hospital, Los Angeles, Calif., Dec. 5. He was on leave of absence in an effort to improve his health. Mr. Gilman was a graduate of the Leland Stanford University, receiving his E. E. degree in 1898. He entered the employ of the Westinghouse company immediately after his graduation and beginning in January, 1901, he was located for two years in the engineering department. In 1903 he was transferred to the British Westinghouse Company and spent the next five years in London. In 1908 Mr. Gilman was recalled to East Pittsburgh and assigned to special duties in the power-engineering department. He was in this department continuously until the time of his death. He leaves a widow.

## Association Activities

Opposition to government interference in private business was voiced at a largely attended meeting of directors of the **National Retail Coal Merchants' Association** in Washington Dec. 14 and 15. It was unanimously agreed to work for association aims, such as standards of coal, through co-operation with governmental agencies rather than by seeking more laws. The Washington headquarters of the association was charged with the duty of collecting all available data relative to the use of fuel oil and other substitutes for coal, for the benefit of dealers needing this information. In discussing "snowbirds," it was agreed that the proper course to pursue is to educate the consumer to recognize that it is better to deal with a permanent coal merchant who has an investment, is responsible and who will stand back of his sales in weight and quality. Secretary Mellon's tax reduction program was endorsed and a resolution to this effect was adopted to be sent members of Congress. President Coolidge's message to Congress was approved. There was informal discussion of the coal bills already introduced in Congress, and of other measures which it is understood will make their appearance. F. W. Schremes, of the Schremes Fuel Service, Kansas City, was elected a vice-president of the Association to succeed the late E. R. Sweeney, of the Sweeney-Bryan-Mitchell Co., Kansas City, who died recently. Bluefield, W. Va., was selected as the meeting place of the next annual convention, to be held in May.

## Recent Patents

**Scraper**. R. G. Le Tourneau, Stockton, Calif.; 1,470,853. Oct. 16, 1923. Filed Sept. 27, 1922; serial No. 590,755.

**Scraper**. J. R. Maginness, Sandy City, Utah; 1,471,178. Oct. 16, 1923. Filed May 7, 1920; serial No. 379,562. Renewed March 27, 1923.

**Scraper**. G. W. Packer, Chicago, Ill., assignor to Goodman Mfg. Co., Chicago, Ill.; 1,471,627. Oct. 23, 1923. Filed Nov. 2, 1922; serial No. 598,480.

**Coal Cutter**. M. S. Moore, London, England, assignor to Cowlshaw, Walker & Co., Ltd., London, England; 1,471,975. Oct. 23, 1923. Filed May 16, 1922; serial No. 563,969.

**Shallow-Pit Coaling Station**. R. S. Jacobsen, Chicago, Ill., assignor to Roberts & Schaefer Co., Chicago, Ill.; 1,472,597. Oct. 30, 1923. Filed Oct. 19, 1918; serial No. 258,855.

**Coal-Cutting Machine and Tool**. I. E. Grunwald, near Munchen, Germany, and Rudolf Wannenmacher, Trautenau, Czechoslovakia; 1,472,641. Oct. 30, 1923. Filed March 28, 1923; serial No. 628,366.

## Publications Received

**Smoke Abatement**, by Osborn Monnett, Bureau of Mines, Washington, D. C. Technical paper 273. Pp. 31; 6x9; illustrated. Discourses upon the pollution of the air, domestic smoke problem and gives results of tests of different coals. Plates showing starting of fires and the adding of coal are included.

**La Destruction et La Reconstitution des Mines de Lens**. Address before National Conservatory of Arts and Trades, March 12, 1922, by E. C. Cuvellette; 9 x 11 1/2 in., pp. 92, 47 full-page illustrations and 2 plates. Illustrations show mines before and after reconstruction. Publisher, L. Danel, Lille, France.

A pamphlet entitled "Trade Standards Adopted by the Compressed Air Society" has just been published embodying the result of extended study and research on the part of the executives and engineers associated with the members of that organization. It embraces the nomenclature and terminology relating to air compressors and their operations; a history of the development of speeds of air compressors; an explanation of capacities and pressures; instructions for the installation and care of air compressors with illustrations of devices suggested for cleaning the intake air; recommendation for the lubrication of air-compressing machines and the cleaning of air-receiver piping; a description of the low-pressure nozzle test recommended by the society, and a partial list of applications of compressed air. The Compressed Air Society has published this pamphlet with the belief that there is a need for such an authoritative work of reference, and that compressed air engineers and users as well as manufacturers of air compressors will appreciate this step toward the establishment of definite trade standards in the industry. Copies may be had from the members, or by addressing the Secretary of the Society, C. H. Rohrbach, 50 Church St., New York.

## Coal Legislation Hopper

**Representative Newton**, of Minnesota, introduced in the House, Dec. 20, a bill authorizing government agencies to gather information about the coal industry. The bill gives the Federal Trade Commission authority to obtain information and make reports about ownership, production, distribution, stocks, investments, costs, sales, margins and profits in the coal industry. The Interstate Commerce Commission is authorized to obtain reports from the railroads relative to car distribution, mine ratings and similar questions. The Geological Survey is authorized to obtain information and make reports relative to coal production. The Secretary of Labor is authorized to obtain information relative to wages and labor conditions. The President is authorized to declare an emergency when in the judgment of the Federal Trade Commission such action is warranted. During such emergency the President would have power to deal in coal and to control production, movement and distribution of coal.

## Trade Literature

**Flanged Obround Condulets**. Four-page folder published by the Crouse-Hinds Co., of Syracuse, N. Y., describing covers and wiring devices for Flanged Obround Condulets.

**Reliance Electric & Engineering Co.**, Cleveland, Ohio, has issued a neat little book entitled "Electric Motors—How to Choose and Use Them." It has 32 pp., is 3 x 6 in.; illustrated.

## Coming Meetings

**Tug River Coal Operators' Association**. Annual meeting Jan. 4, 1924, Bluefield, W. Va. Secretary, C. C. Morfit, Welch, W. Va.

**New England Wholesale Coal Association**. Annual meeting Jan. 8, 1924, Boston, Mass. Secretary, R. S. Townsend, Boston, Mass.

**Engineers' Society of Western Pennsylvania**. Annual meeting Jan. 15, 1924, Blue Room, William Penn Hotel, Pittsburgh, Pa. Secretary, K. F. Treschow, Pittsburgh, Pa.

**American Wood Preservers' Association**. Annual meeting Jan. 15-17, 1924, Hotel Buehlebach, Kansas City, Mo. Secretary, P. R. Hicks, Chicago, Ill.

**Northeast Kentucky Coal Association**. Annual meeting Jan. 24, 1924, Ashland, Ky. Secretary, C. J. Neckamp, Ashland, Ky.

## News Items From Field and Trade

### ILLINOIS

The United Electric Coal Mining Co. during the past year has purchased 2,500 acres of strip coal lands within three miles of Cuba, Ill., at a cost of \$300,000. The company is now building a steel tippie and grading plant of 4,000 tons capacity in eight hours. Three steam shovels, each costing \$110,000, and railroad tracks and switches costing \$250,000 have been erected. The total investment is expected to exceed \$1,000,000.

After two years and a half of development work, initial production has been reached by the new Shuler Coal Mining Co. mine at Alpha. The mine is now producing 100 tons daily, but in a few weeks the output will be raised to 300 tons. By next year the company expects to be producing 1,000 tons daily. As the Shuler company will attempt to market the bulk of its product in Davenport and Bettendorf, Iowa, and Moline, East Moline and Rock Island, Ill., it is believed that the competition will be keen in the steam coal line when this big mine has once been put on a capacity production basis. The company has 2,000 acres in the tract where development is now taking place. Charles Shuler, of Davenport, president of the Iowa National Bank and owner of extensive coal lands in Colorado and Iowa, is the head of the concern, and Charles Shuler, Jr., is the manager at the new mine in Alpha.

The Tiger Coal Co., Cuba, Ill., has opened a shovel mine, at a cost of \$100,000.

### INDIANA

On application of the Consumers Coal Co., of Indianapolis, John F. Heinze, a coal operator of Boonville, has been appointed receiver of the Key Coal Co., which has operated a mine near Boonville. The coal mine has not been in operation since March 15.

"There appear to be too many mines and miners," said William Mitch, secretary of District 11, United Mine Workers, recently in commenting on reasons why Indiana mines are shut down 40 per cent and why the other 60 per cent is working only half time. John Hessler, district president, said freight-rate adjustments to give Indiana coal a better competing chance would help.

The Primrose Coal Producing Co. of Indianapolis, has been dissolved. William Schroluche was president.

### KENTUCKY

Early in the coming year the Northwest Kentucky Coal Association will move its offices to the recently completed Ashland National Bank Building. A number of operating companies in the Big Sandy field will establish offices in the new bank building. John E. Buckingham, a pioneer in the development of the Big Sandy field, is president of the Ashland National.

### MASSACHUSETTS

Eugene C. Hultman, State Fuel Administrator, estimates that the total cost to the people of Massachusetts for heating their homes with anthracite during the current year will be \$90,000,000, double the cost of eight years ago. He says that this coal bill consists of \$50,000,000 for the anthracite at the mines in Pennsylvania, \$20,000,000 for transportation to Massachusetts, and another \$20,000,000 for delivery and other charges to the consumers' cellars.

### MISSOURI

At a meeting Dec. 15 the board of directors of the Central Coal & Coke Co. declared the regular dividend of 5 per cent on preferred and 6 per cent on common stock. John H. Kirby, who recently acquired a controlling interest in the company, was elected to the board to succeed C. F. Fox, and Thomas Mackie, general purchasing agent and a stockholder, was chosen to succeed J. R. McAllister.

### NEW JERSEY

Joseph Malloy, formerly of the Clearfield office of Halden-Kelley Coal Co., has been transferred to the Newark office of the company. He will be in charge of the office management under Ira M. Van Vliet.

### NEBRASKA

The East mine of the Brewerton Coal Co., which has been closed for two months, as the result of labor trouble, resumed operation on Nov. 27 and the work of cleaning up the mine preparatory to hoisting coal was started. The closing was the climax of a series of short shutdowns due to labor trouble.

### NEW YORK

The Westmoreland Coal Co. on Dec. 18 declared an extra dividend of 1 per cent and the regular quarterly dividend of 2 per cent, payable Jan. 2 to stock of record Dec. 27.

A. T. Ward of the Acme Coal Mining Sales Corporation has transferred his office to 1 Broadway, New York.

Colonel Oscar H. Fogg has resigned as secretary-manager of the American Gas Association. Colonel Fogg, who has headed the gas association since 1919, leaves to assume the position of president and general manager of the Baltimore Gas Appliance & Manufacturing Co., Baltimore, Md. Alexander Forward, of Richmond, a member of the State Corporation Commission of Virginia, has resigned that post to accept the position with the American Gas Association made vacant by the resignation of Colonel Fogg. The American Gas Association has a membership of more than 500 manufactured gas utilities in the United States and Canada.

### OHIO

The Stark Mineral Co. has been chartered with a capital of \$10,000 to operate coal mines in the Tuscarawas field as well as to produce clay and other minerals. Incorporators are: Thomas C. Eayrs, Frank F. Bamberger, M. H. McCormick, W. L. DeHoff and Joseph A. Miller.

The Co-Operative Coal Co., Cleveland, has been chartered with a capital of \$10,000 to operate coal mines and sell coal at wholesale and retail. Incorporators are John K. Frye, Ray J. Curry, Della I. Curry, Georgenne A. Frye and H. H. Henry.

The Ohio-Cities Coal-Supply Co., Akron, has been incorporated with a capital of \$500,000 to buy, sell and mine coal. Incorporators are S. R. Enderton, M. D. Hubbard, W. D. Stuhldreher, L. W. Rinear and H. E. Kepler.

A charter has been granted in Delaware to the Antiquity Coal Corporation, with a capital of \$800,000. The incorporators' names are: Elmer H. Holmes, Syracuse, Ohio; Charles Ebersbich, Pomeroy, and L. D. Davis, Middleport, Ohio.

### OKLAHOMA

The Wise Mine of the Henryetta Coal & Mining Co., at Okmulgee, was badly damaged by a cave-in on Dec. 9. The loss is estimated at \$100,000. The Wise is one of the oldest coal shafts in the Henryetta field.

### PENNSYLVANIA

A. B. Sheets, of Pittsburgh, Pa., vice-president of the Hillman Coal & Coke Co., has been elected to the board of directors of the Oakland Savings & Trust Co., Pittsburgh.

The four and a half mile belt conveyor system and two 35-car rotary dumps to feed the belt, being installed by the H. C.

Frick Coke Co. to convey the coal underground from their three Colonial mines at Grindstone and Smock, Fayette County, to the River near Fayette City is expected to be ready for operation by Jan. 1.

W. A. Chandler, consulting engineer for the Hudson Coal Co., has appointed C. J. Adams as electrical engineer to succeed James James, resigned, who has accepted a position with the Lehigh Coal & Navigation Co. Mr. Adams was formerly assistant consulting engineer for the Hudson company. R. J. McClure has resigned from the engineering department of the Hudson company, and J. F. Lewett has been named in his place.

The Philadelphia & Reading Coal & Iron Co., through J. F. Whalen, chief counsel, at Pottsville, on Dec. 18, resolutely opposed any settlement of the suit for taxes brought by the Schuylkill County Commissioners at a hearing before Judges Bechtel, Koch and Berger. Mr. Whalen, said that it was the purpose of the corporation to get a definite judicial decision on the heavy increase in taxes on its lands irrespective of any settlement made by other companies with the County Commissioners, and a decision solely upon the evidence presented.

The general grievance committee representing the 17,000 miners of the Lehigh Valley Coal Co. between Wilkes-Barre and Old Forge, at a meeting in Exeter, Dec. 14, decided to call off the strike, and have their grievances adjusted under the direction of District President Cappellini. The district president told the men that Mr. Thomas had agreed to reinstate the five miners discharged at the Maltby colliery for refusing to place a 9-in. topping on their cars, and that Mr. Inglis had assured him that no time would be lost by the conciliation board in taking up the grievances of the Valley miners.

Branson, Long & McFadden, Inc., with offices in Philadelphia, Johnstown and Pittsburgh, have sold their business to the Triangle Coal & Coke Co., of Pittsburgh, as of Jan. 1, 1924. The latter company was recently incorporated in Pennsylvania with a capital stock of \$25,000 by W. B. Atwood, president of the Bunker Coal Co., and his associates. Branson, Long & McFadden, Inc., have acted as sales agents for Bunker coal together with other high-grade steam and gas coals and the business will be carried forward by the new company in the same manner as before. J. L. Sease, E. C. Dodson and N. L. Parkins, formerly of Branson, Long & McFadden, Inc., will be in charge of the Philadelphia, Johnstown and Pittsburgh offices, respectively. The main office of the company will be consolidated with the offices of Bunker Coal Co. in the First National Bank Building, Pittsburgh, Pa.

Fire destroyed the Tip Top breaker of the Beaver Valley Coal Co., west of Hazleton on Dec. 10. The breaker has not been in operation this month, owing to a strike called on Nov. 30 by 150 of the workmen. The strike was due to the discharge of a foreman and the claim that a spy system had been in vogue. The company lacked fire-fighting facilities there and once the fire was started it could not be checked.

The first semi-annual meeting of the Coal Mining Institute of the Ninth Bituminous District was held on Dec. 1 at Connellsville, S. S. Hall, mine inspector of the Ninth District, presided and addresses were made by John L. Gans of *The Weekly Courier*; Captain Steidle, of the Mining Department of Carnegie Institute of Technology, Pittsburgh; J. E. Struble, of H. C. Frick Coke Co., and Richard Maize, of Uniontown, president of the Coal Mining Institute of America, and others.

The Clearfield Bituminous Coal Corporation has been granted a permit for the enlargement of the existing impounding reservoir on Hinty's Run, the source of the water supply for the company's village of Commodore, Green township, Indiana County.

A state permit has been issued to the Jefferson & Clearfield Coal & Iron Co. for the construction of a water-works system in its mining village of Aultman, Centre township, Indiana County.

The Central Pennsylvania Coal Producers' Association has resumed publication of its "Bulletin" which was suspended some time ago. The co-operation of all members of the association is sought in order to make the publication a success.

L. N. Williams, it has been announced, has become traveling coal freight agent for the Baltimore & Ohio, with headquarters at Pittsburgh.



The Lehigh Valley R.R. has started to store soft coal for use on engines on the Hazleton & Mahanoy division of the road, it was announced on Dec. 17. There is a pile of the fuel totaling between 10,000 and 12,000 tons at Delano, which was gathered last spring and summer, and to this has been added between 2,000 and 3,000 tons during the last few weeks.

Miners employed by the Pennsylvania and Hillside Coal companies in northeastern Pennsylvania had a record output of coal on Dec. 15, according to company officials, who say that 33,870 tons was prepared and shipped to the market in eight hours. The upper district of the Pennsylvania Coal Co. led with 21,870 tons to its credit. The lower, or Pittston district, turned out 12,000 tons, which was a light increase in production for this district, which prior to 1920 turned out as high as 15,000 tons of coal in a day. In the record made the No. 1 colliery, at Dunmore, had the largest output, 7,500 tons. For the past few months the mines of the Pennsylvania and Hillside companies, in the Pittston district, have not been hampered in production by petty strikes.

S. J. Phillips, state mine inspector, at Scranton, in a letter mailed to the Carnegie Hero Fund Commission called the commission's attention to the heroism displayed by Eben Jones, mine foreman at the Mount Jessup mine, who on Dec. 8 in an attempt to warn four fellow-workers of impending danger, was himself imprisoned with them under a fall of hundreds of tons of rock and coal. His body has since been recovered. Mr. Phillips describes the act of the hero-foreman as "one of the most heroic ever recorded in the anthracite field," and urges that the commission do its utmost in rewarding the hero.

Joseph J. Walsh, Secretary of Mines, told the Governors' Conference, at Harrisburg, on Dec. 14, in opposing the repeal of the certification law, that there are enough miners in Pennsylvania now. He added, however, that there was room for 22,000 additional laborers, on whom there are no restrictions in the way of required qualifications.

Although Mrs. Eckley B. Cox, wife of the late Senator Cox, pioneer anthracite operator, is seriously ill at her home in Hazleton, the forty-eighth annual visit of the "Coxe Santa Claus" was made to 3,000 school children of Beaver Meadow, Buck Mountain, Eckley, Stockton No. 7, Oneida, Tombick, Derringer, and Garven. Each boy and girl received a new \$1 bill and a half pound box of chocolate candy.

## UTAH

Entry on 900 acres of coal lands in the Fish Lake National Forest is being protested by the field department of the U. S. Land Office. It is claimed that Olive Beebe, Rank Foote, Oscar Beebe, John F. Beebe and May B. Browning, claimants of the land, had not improved a mile of coal up to July 26, 1906, the date the government took over the preserves. The land in dispute is about eight miles from Emery.

The Utah Fuel Co. has announced its intention to test the constitutionality of that section of the Utah Workmen's Compensation law which provides that in addition to the burial expenses the employer of a person who dies leaving no dependents shall pay to the State Treasurer 20 per cent of the amount that would have been due such dependents. The question is now being considered by the Industrial Commission and is expected to go before the Supreme Court at an early date. If the law is not upheld a second problem will be the disposal of the \$30,000 which has been collected under the law so far.

## WEST VIRGINIA

George R. C. Wiles, former chairman of the West Virginia Public Service Commission, speaking at the Lions Club Luncheon, Dec. 14, at Charleston, said that the trouble with the coal business in West Virginia is over development and the remedy for the situation is less government regulation through commissions and investigations and the establishment of fair competitive conditions. "Investigations and the creation of commissions can only result in the producers losing and the consumers paying," he concluded. "Give us fair competitive conditions and the law of the survival of the fittest will make West Virginia the greatest coal-producing section in the world."

Less than 1 per cent of the coal in West Virginia has been mined and at the present

rate of production the supply in West Virginia will last for 1400 years. Stephen Hays, general engineer of the Westinghouse Electric & Mfg. Co., said in an address before the Business Club of the West Virginia University. He also asserted that the available coal area in West Virginia is about 9,500 square miles, sheltering something like 60,000,000,000 tons of good coal and about 100,000,000,000 tons of low-grade coal.

A jury in the U. S. District Court at Charleston on Dec. 12 returned a verdict recommending judgment of \$899,054.60 for the White Oak Coal Co. from the United States Government. The company sued to recover that amount by representing the difference between the price paid by the Navy Department for coal requisitioned between July 1, 1919, and April 1, 1921, and the prevailing market price. Approximately 210,000 tons of coal was requisitioned at that time, the coal company asserted. Motion was made for a new trial by U. S. Attorney Elliott Northcott, who requested 60 days in which to prepare and file his reasons for a new trial.

The Valley Fuel Co., has increased its capital stock from \$100,000 to \$500,000 and the Kenawha Valley Coal Co., of Charleston, has increased its capital stock from \$100,000 to \$2,000,000. The Jake Henry Coal Co. has changed its general plan of stock issue from 3,000 shares of common stock to 2,500 shares of common stock and 500 shares of preferred stock, and the Indian Run Collieries Co. has changed its general plan of capitalization from 3,000 shares of preferred and 7,000 shares of common stock to 10,000 shares of common stock. The Behler Coal Co. and the Flat Run Gas Coal Co. have filed notices of dissolution with the Secretary of State of West Virginia.

There has been more activity among some of the larger mines in the New River field since Dec. 1. All sixteen of the mines of the New River Company, which had been working on a part-time basis, started working full time soon after the first of the month.

## WISCONSIN

The late Edward A. Uhrig, president of the Milwaukee-Western Fuel Co., left an estate valued at \$4,361,489.42, according to the inventory and appraisal filed with the Probate Court, Milwaukee, Dec. 12, 1923. The inventory includes 10,700 shares of stock in the fuel company, held to be worth \$3,152,220. The deceased gave 911 shares of stock in the company, valued at \$268,380, to his son, Alex. B. Uhrig, some years prior to his death. His salary as president of the Milwaukee-Western Fuel Co. was \$18,000 per year. The entire interest of the Uhrig family was acquired by Pittsburgh interests some months ago. Joseph W. Simpson is now president of the company.

The Milwaukee Western Steamship Co., subsidiary of the Milwaukee Western Fuel Co., has sold the two coal steamers, the Joseph W. Simpson and the Alex. B. Uhrig, to the Reiss Steamship Co., of Manitowoc, which is controlled by the Reiss Coal Co. The Reiss company now has eleven vessels in the lake coal traffic.

## WASHINGTON, D. C.

The annual budget for the fiscal year ending June 30, 1925, submitted to Congress by President Coolidge, shows that the U. S. Coal Commission expended \$452,195.56 of its \$600,000 appropriation, that the expenditure for 1924 will be about \$138,000, leaving approximately \$10,000 to be returned to the Treasury. Among the other items of interest to the coal industry contained in the budget are: \$14,500,000 for coal and other fuel, including transportation, for the navy; \$4,250,000 for fuel for the army; \$1,805,272 for the Geological Survey; \$1,909,573 for the Bureau of Mines; \$78,000 for continuation of the investigation of mineral resources of Alaska, and \$136,734 for the preparation of reports of the mineral resources of the United States, including special statistical inquiries as to production, distribution, and consumption of the essential minerals.

Dr. R. R. Sayers, chief surgeon of the Bureau of Mines, is in England on the last lap of a trip which has included a study of health conditions in mining communities in Australia, New Zealand, South Africa, and Europe. Dr. Sayers expects to arrive in Washington the latter part of December or the first of January.

Agreement between a labor union and employers which results in a limitation upon production is not a violation of the Sherman anti-trust law, at least in a specific case where the public interest was not affected, according to the decision of the U. S. Supreme Court, Dec. 10, reversing a decision of the lower courts in granting the government an injunction against the National Association of Window Glass Manufacturers, the National Window Glass Workers and others. The union and the association last year negotiated a contract in two parts, one to run from Sept. 25, 1922, to Jan. 27, 1923, and the other from Jan. 29 to June 11, 1923. It was provided that no employer could have both contracts. This resulted in closing those plants which did not have a contract. The object was to provide practically continuous employment for the 2,500 members of the union, which makes hand-blown glass, as business was insufficient to operate all plants continuously because of the competition of machine-made glass. One end to be accomplished was to prevent skilled workers from leaving the industry because of part-time employment. Although the lower courts declared this to be a violation of the Sherman act, the Supreme Court, through Justice Holmes, held that there was no conflict between this contract and the law.

Charles L. Dering, president of the American Wholesale Coal Association, has appointed the following committee to serve on Advisory Committee to the Coal Division of the Department of Commerce: Charles L. Dering, Chicago, Ill.; Borden Covell, vice-president (president Northern Coal Co.), Boston, Mass.; Seth W. Morton, Member of Senior Council (sales manager of W. G. Morton), Albany, N. Y. Alternate members: Benjamin H. Read, Director (Lynah & Read), Baltimore, Md., and G. H. Snowdon, director (president of the G. H. Snowdon Co.), Pittsburgh, Pa.

Washington retail coal dealers, represented by J. Maury Dove, Jr., president of the Coal Merchants' Board of Trade, and by officials of the National Retail Coal Association, presented to Secretary of the Interior Work on Dec. 14 a proposal to take over the entire government coal business in Washington. Secretary Work took the proposal under advisement, and prior to familiarizing himself with the details of the proposition, asked the dealers to withhold the provisions of their proposal.

## CANADA

Lack of employment at some of the mines of the British Empire Steel Corporation at Sydney has become so serious that the provisional officers of the United Mine Workers at Glace Bay have appealed to Prime Minister W. L. MacKenzie King and other Canadian officials for relief. After stating that the mines are working only one or two days a week and some weeks not at all, and that some of the families are in destitute circumstances, the union leaders in their telegrams to the authorities say that it is their opinion that the government of Canada should make arrangements to take coal from these mines, so as to relieve the unemployment situation, instead of buying coal from the non-union coal operators in the United States.

Alberta Ontario Coal Imports, Ltd., of Toronto, has been incorporated with a capitalization of \$50,000. The provisional directors are Norman S. Robertson, George McC. Willoughby and Harold L. Steele.

The Western Coal Co., Ltd., has been organized at Toronto and has been granted an Ontario charter to carry on business as a coal operator. The authorized capital is \$40,000 and the provisional directors are H. A. Newman, M. R. Newman and F. M. Walzman, all of Toronto.

The last shipments of coal for the season have been made from the Nova Scotia coal mines to the St. Lawrence ports. The total shipments for the year to the St. Lawrence market are approximately 1,100,000 tons, which is an increase of 84,000 tons over last year, but less than was expected early in the decision. Many buyers during the strike transferred their orders from Nova Scotia to the United States.

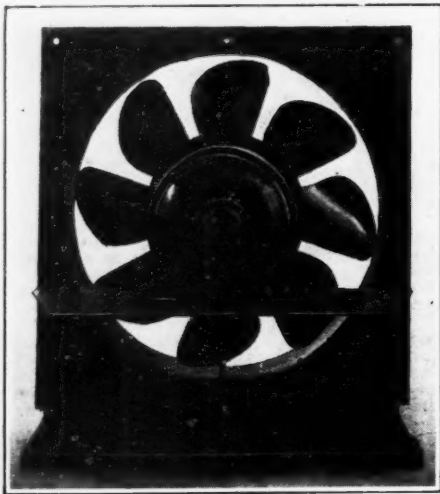
As a result of the 1922 coal strike official government figures on exports of coal to the United States from Nova Scotia—the great bulk of which comes from the collieries of the British Empire Steel Corporation—show a striking gain for the coal year, ended March 31, 1923. Figures for the last three years, ended March 31, are as follows: 1921, 42,479 tons, valued at \$417,233; 1922, 16,057 tons, valued at \$129,322; 1923, 580,073 tons, valued at \$3,557,101.

## New Equipment

### Disk Mine Fan Fitted with Aeroplane Blades

Ship and aeroplane propellers always have had curved faces. It is natural that the blades of mine fans should be similarly constructed. A new mine ventilator with curved blades known as the Robinson Coniflo Disk fan is now being manufactured by the Robinson Ventilating Co., of 6027 Jenkins Ave., Pittsburgh, Pa. In eight comparative tests conducted by some of the largest coal companies these fans of equal size to those they have replaced are said to have produced larger volumes and higher pressures, operating at the same speeds and using the same motor.

Every fan operating at high speed and against high pressure has a marked short-circuit in the center of the wheel. This is called the back flow. It is caused by the peripheral speed reaching a maximum at the tips of the wheel and being practically zero at the roots of the blades. It is claimed by the manufacturer that this fault cannot be corrected by overlapping the blades be-



FAN BUILT TO PREVENT BACK FLOW

The fan revolves in the direction of the hands of a clock. Air leaves the blades not only near the casing but also near the disk. In consequence the pressure is more nearly equal over the whole airway ventilated.

cause this restricts the space through which the air must travel and slows the speed of the air through the wheel.

To a large extent the back flow is avoided with this fan because it is provided with such liberal space that the air can travel through the wheel at speeds that will create the pressure desired. The curvature of the blades assists the air to take a direction parallel to the axis of rotation of the fan and the large disk in the center of the wheel retards the back flow. The air is not discharged violently against the casing but along the edges of the blades. This gives the fan a higher volumetric

capacity and a greater mechanical efficiency than would otherwise be attained. The curved blades and the large center disk also give the air a much higher speed per revolution and permit the fan to be fairly efficient against pressure up to 2½ in. gage.

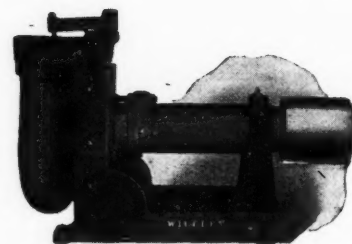
Compactness saves erection difficulties and makes the fan more portable. The fact that the blades are stamped from heavy sheets, riveted and braced by heavy plates to the center disk makes the wheel so strong that it can be operated to 1,000 r.p.m. Rods, bolts and nuts are eliminated in the bracing, consequently the braces cannot work loose. The balance also is maintain at all speeds. Either ring oiling or ball bearings can be used.

### Centrifugal Pump to Handle Water with Dirt Solids

The Wilfley centrifugal sand pump, recently developed by the A. R. Wilfley & Sons Co., Denver, Colo., has as an important feature the elimination of the stuffing box, which in most centrifugal pumps gives considerable trouble when pumping gritty material.

The seal on this pump consists of a revolving member having radiating wings, called an "expeller," which prevents the material from leaking out by centrifugal action. An automatic check-valve seal is around the shaft while the pump is not in operation. Another important feature of this pump is the slippage seal adjustment. When this slippage occurs, as it does to some extent in all centrifugal pumps, it causes a reduction of capacity and efficiency. This leakage depends upon the clearance between the runner and the side plate. Gritty water in time increases this clearance and therefore cuts down the efficiency.

It will be interesting to note that this pump is fitted with ball bearings. The bearing assembly is of unit con-



PUMP FOR COAL WASHING

The wet process of coal washing and separation requires pumping of water containing much grit. A pump capable of meeting this condition must be simple, efficient and able to resist wear.

struction, independent of the frame.

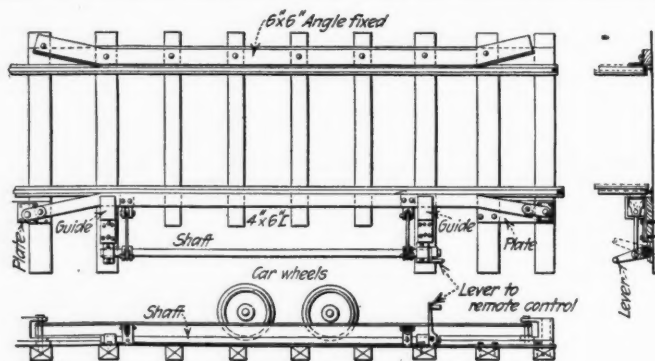
The wearing parts are all easily replaced in a few minutes, and this quick change feature is particularly valuable where a spare pump is not available or when the nature of the material handled is gritty, such as is the case where coal washing and a wet preparation process is used.

### Mine-Car Retarder

In many cases the grade approaching the cage or dump is so steep that it is impossible to put in a cager or stops of any kind, as the load of the trip will bend the axles of the cars. Then again it is often desirable to control a trip of cars on steep grades. A device known as the Nolan mine-car retarder rubs the surface of the wheels of two or more cars and brings such pressure upon them that the cars can be brought to a complete standstill, if desired, and released so that the cars will move forward one, two or more at a time.

On one side of the track is a fixed guide which consists of a heavy channel, securely bolted to the ties. On the other side is a similar channel which is movable, and is moved in and out against the wheels of the cars by means of a hand lever situated wherever desired. This second channel moves upon slide plates and a spring will move it into its inoperative position, whenever the pressure from the lever is released. It is asserted that one man, by means of this simple machine, can control a long and heavy trip and feed the cars as desired.

The complete equipment is now being placed on the market by the Mining Safety Device Co., of Bowerston, Ohio.



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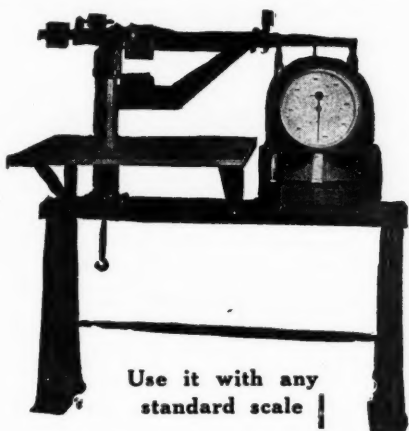
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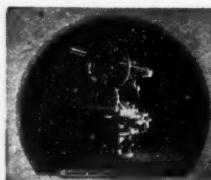
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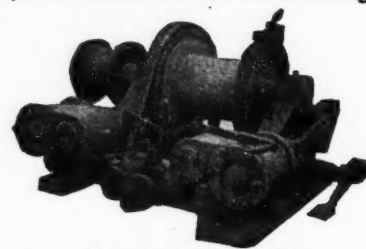
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- 2—42-in. ga., 250-v. Jeffrey, 28-A, shortwall mchs.
- 1—44-in. ga., 250-v. Goodman, Type 12DA, short-wall machine.
- 1—44-in. ga., 250-v., CE-7, Sullivan shortwall machine, 7½-ft. undercut.
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- 250 VOLT MINE LOCOMOTIVES**
- 2—2½-ton, 36-in. ga., 250-v., trolley type, Goodman gathering locomotive, with cable reel.
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- 1—5-ton, 42-in. ga., 250-v. Baldwin-Westinghouse, trolley type locomotive.
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- 1—6-ton, 39-in. ga., 250-v. Morgan-Gardner, Class F, trolley type locomotive.
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### D. C. Direct Connected Units

Kw. Generator	Engine	Volts
300 Cr.-Wheeler	Watts-Campbell-Corliss	250
300 G.E. (3 wire)	Erie Ball, 4-valve	150
250 Ridgway	Ridgway, side crank	250
200 G.E. (3 wire)	Ames	250-125
200 Allis-Chal.	Allis-Chal.-Corliss	125
200 Gen. Elec.	Erie, 4-valve	250
160 Gen. Elec.	Skinner	125
150 Gen. Elec.	Curtis Turbine	125
150 Gen. Elec.	Skinner	250
120 Gen. Elec.	Harrisburg, side crank	250
100 Gen. Elec.	Erie Ball	125
100 Gen. Elec.	Harrisburg	250
75 Gen. Elec.	Harrisburg	125
75 Westhse. (3 wire)	Ames	250-125
60 G.E. (3 wire)	Skinner Uniflow	250-125
60 Gen. Elec.	Harrisburg	125
50 Gen. Elec.	Skinner	125
40 Ridgway	Ridgway	125
35 Westhse.	Ball Wood	125
25 Westhse.	Ames	125

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44	7 1/2	13-D	440	1200	A.C.
2	7 1/2	1 form	440	900	G.E.
5	10		440	900	G.E.
3	10	17-G	440	1200	A.C.
3	10	17-C	440	1200	A.C.
10	15	17-K	440	1200	A.C.
4	15		440	720	G.E.
1	15	1 form M	440	900	G.E.
1	30	20-G	440	1800	A.C.
4	30	CS	440	1200	West.
6	30	KT 332	440	1200	G.E.
4	40	MT 336-Y	440	1200	G.E.
2	40		440	1200	West.
2	75	CS160874-A	440	1800	West.
1	150	CS179274-B	2200	1800	West.
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Single Phase, 60 Cycle

2	10	RI-627	220/110/1800	G.E.
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All Motors in Excellent Condition

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Old Hickory, Tennessee

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3 CE 7	Sullivan	SDO
1 CE 7	Sullivan	SAO
2 12 A	Goodman	SDO
2 12 G	3 A Goodman	SAO
1 35 B	Jeffrey	SAO
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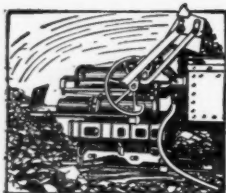
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## AMERICAN RING CRUSHER

This machine will convert R. O. M. coal into the exact size needed for your stokers and do so longer and more efficiently than any other crusher in the world. Let us send you complete details.

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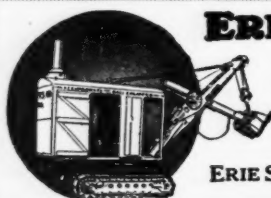
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volt primary  
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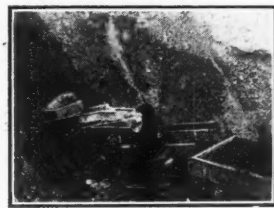
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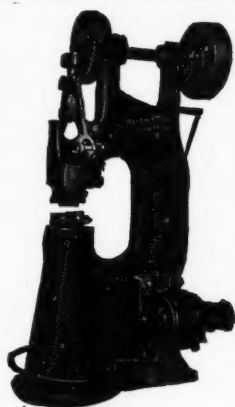
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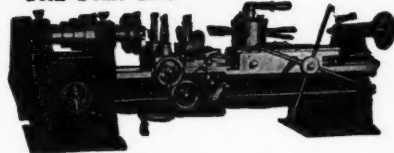
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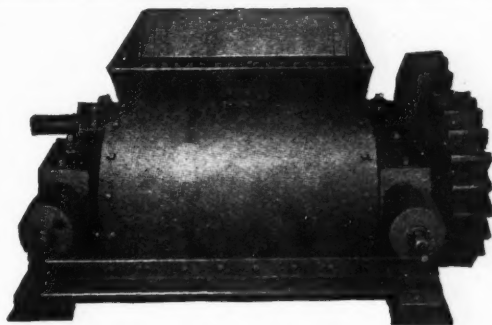
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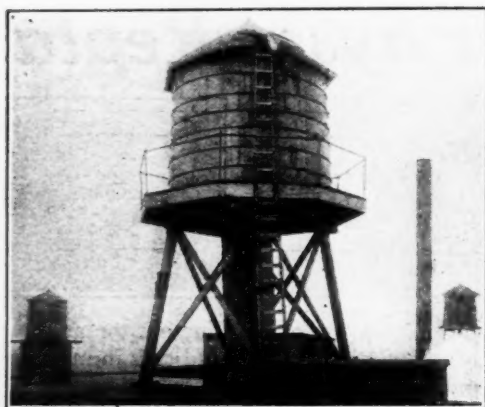
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Double Disc  
Bronze 150  
lbs. W.S.P.

Fig. 768  
Wedge  
Disc.  
Bronze.  
200 lbs.  
W.S.P.

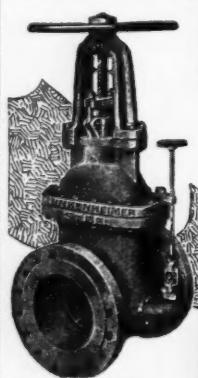


Fig. 1354  
Wedge Disc  
Steel 350 lbs.  
W.S.P.

Fig. 892  
Wedge Disc  
Iron. 250 lbs.  
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Fig. 647  
Wedge Disc  
Iron. 125 lbs.  
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100 lbs.  
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### "CEAG" Inspector's Lamp

#### Chosen by U. S. Navy for Use on Shenandoah (ZR-1)

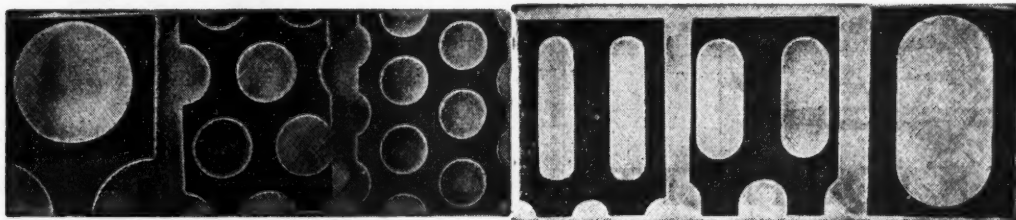
The "CEAG" Inspector's Lamp, Type G.M.S. is up to U. S. Navy standards of *safety* and *efficiency*.

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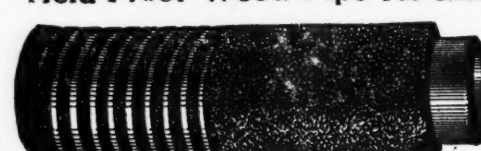
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**Acid-Proof Wood Pipe for mine water**




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SOFTENING & FILTRATION  
FOR BOILER FEED AND  
ALL INDUSTRIAL USES

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# LIDGERWOOD MINE HOISTS

*Steam—Electric*  
*For very mine Service*

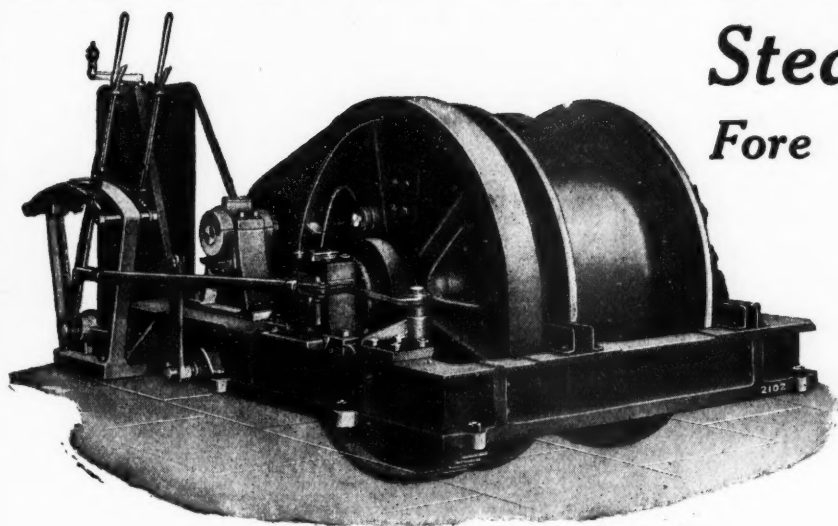


Illustration shows a newly designed band friction hoist, of medium size.

This hoist is proving very successful in operation.

It is built to the usual Lidgerwood standard quality of design, workmanship and material, insuring a smooth running, well balanced hoist.

**SPEED**

**STRENGTH**

**SAFETY**

**WITH ECONOMY IN OPERATION**

*Requests for Catalogs invited*

**LIDGERWOOD MFG. COMPANY**

**96 LIBERTY STREET, NEW YORK**

Philadelphia Pittsburgh Chicago Detroit Seattle Brown-Marx Bldg., Birmingham, Ala. Los Angeles Cleveland Portland, Ore.  
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## *“Tool Steel” Gear vs. Special Quenched*

A large mining property equipped two test locomotives at the same time, one with “Tool Steel” pinions, one with a highly recommended “special” of another make, claimed to be “as good as Tool Steel.” The two locomotives operated in the same service for the same time and the pinions were examined and impressions taken to show wear.



← This is the impression of the

**“Tool Steel” Pinion**

This is the impression of the →

**High Grade Special  
Pinion**

*After Identical Service*

They Standardized on  
“Tool Steel”

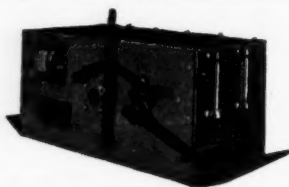
Do you wonder?



“Tool Steel” gears last from 5 to 8 times as long as untreated and two to three times as long as special quenched.

The Tool Steel Gear & Pinion Co., Cincinnati, Ohio

### The Safety-First Friction Clutch Room Hoist



Entirely enclosed with a steel frame. Easily operated by unskilled labor. No danger. No jerk. Any speed desired.

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Flood City Mfg. Co., Johnstown, Penna.

## *Flood City*

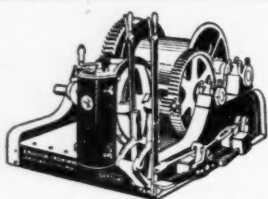
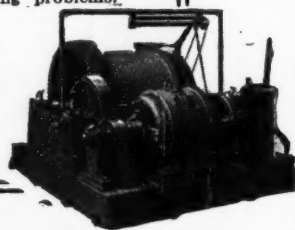
### OTTUMWA Electric and Steam HOISTS

Ottumwa Hoists comprise a line which completely covers the requirements of coal mines. Ottumwa Engineers are always available for consultation regarding hoisting problems.

Ottumwa Iron Works

Ottumwa, Iowa

Ottumwa Electric and Steam  
Hoists, Mine Cars, Sheave  
Wheels and Rollers and  
Roller Bearing Trucks.



Electric Hoist

Hoists for every class  
of mine service

Iron Works Dept.

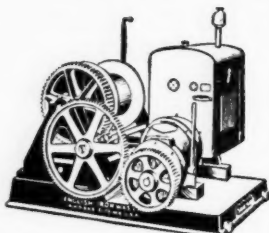
English Tool  
& Supply Co.

Kansas City, Mo., U. S. A.

### "SAMSON"

Electric Hoists

Gasoline Engine Hoists



4-Cylinder Engine Hoist

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Strong, rugged guards for protecting lamps in dark places in pits, in and around machinery where men must have plenty of light in emergencies. Write for data sheets illustrating and describing all types

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Robinson Ventilating Co.

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Factory at Harmony, Pa.



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HERRINGBONE GEARS

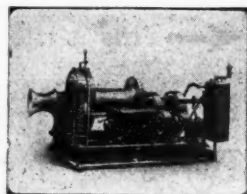
Precision-made speed reduction units  
—any size—for any job.

THE FALK CORPORATION  
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### FOR GENUINE "TOLEDO" "TOLEDO" PIPE TOOLS—WRITE



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Made by

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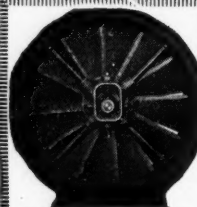
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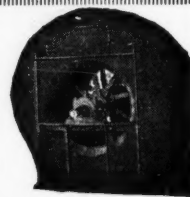
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SURE-GRIP Trolley Clamps never rust up so that they cannot be taken down and removed for use in a new location. Threads are absolutely protected from effects of moisture, rust, etc.—making the Sure-Grip good for years of service. They never wear out.

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**Electric Railway Equipment Co.**  
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# SURE-GRIP

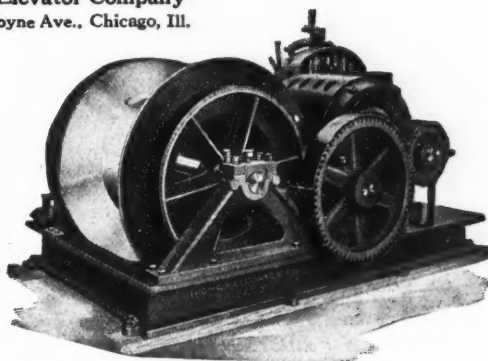
# THOMAS

Thomas Hoists are built to meet every requirement of the mine operator and are designed and constructed with the sole idea of rendering efficient day-in-and-day-out service in shaft, slope or tippie hoisting, thus speeding mine production, and helping to keep the production costs low.

The illustration shows one type of Thomas coal hoist, being the type most commonly used for slope hoisting where the rope pull is in excess of 3500 pounds and where long lengths of cable are required. This hoist has patented band friction and deep flange drum. They are built in various sizes to meet different requirements.

*Builders of Hoists for over 30 years*

**Thomas Elevator Company**  
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# HOISTS

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## Rugged Strength

The outstanding rugged strength built into Atlas Storage Battery Locomotives assures years of hard, rough service at a small cost for upkeep. Painstaking attention to minor parts as well as to the main units has made Atlas first among operators everywhere. Maintenance is a very small problem where Atlas Motors are in use. Our engineering department can and will solve your haulage problems. Our files are full of successful designs. Let us show them to you.

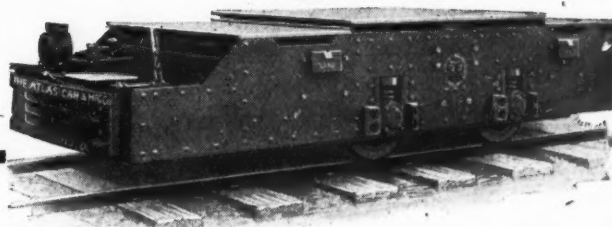
**The Atlas Car & Mfg. Co.**

Engineers

Manufacturers

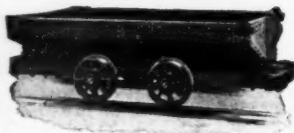
**CLEVELAND, OHIO**

*Type "D"  
for Low Coal*



## THE LORAIN STEEL COMPANY

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Manufacturers of Steel and Composite mine cars, and all kinds of mine track work.

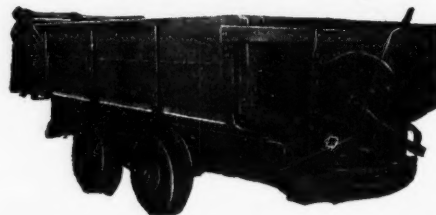
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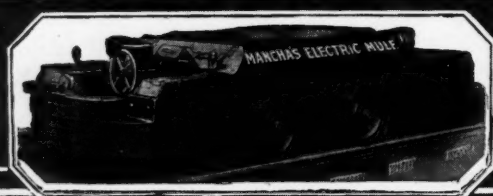
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# LIMA *Shay Geared* LOCOMOTIVES

**S**POTTING in minimum time is an important test of the suitability of a mining locomotive.

You can spot quicker and more accurately with a Shay than you can with a rod engine of the same power.

Unlike the rod engine, the Shay has three cylinders—two are always working when one is centered. Thus, the Shay starts quickly and with its full power.

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*Plymouth Locomotive at Howard, Guthery & Co., Clarksburg, W. Va.*

### Plymouth Gasoline Locomotives in Coal Mine Haulage

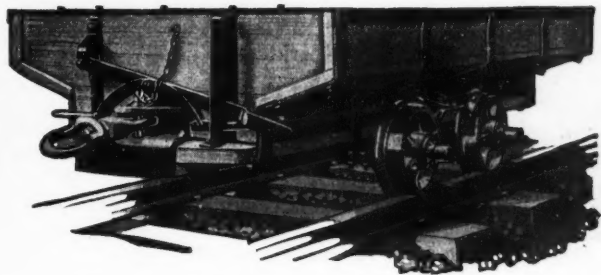
In 1916, Mr. Dan Howard, President of Howard, Guthery & Co., Clarksburg, W. Va., bought a PLYMOUTH Gasoline Locomotive. This proved so satisfactory it was quickly followed by a repeat order. Mr. Howard writes:

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THE FATE-ROOT-HEATH CO., PLYMOUTH, OHIO

**PLYMOUTH**  
*Gasoline Locomotives*



We shipped Watt Cars to northern Canada 14 years ago—had hard service and now they are bringing them back to the states for another mine operation.

**IT PAYS TO BUY  
WATT CARS**  
*"The Best"*

*The*  
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MINING CAR  
WHEEL CO.**  
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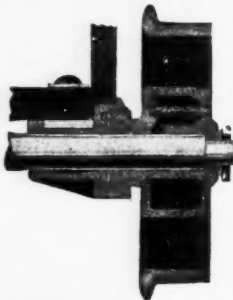
## Is easily applied with a few large bolts

Is seldom shopped on account of truck trouble.

Holds lubricant for long periods.

Is guaranteed for a year against hub wear.

Has full-floating axles with visible linch pins.



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This Truck is the ideal running-gear for large or small mines, light or heavy cars, animal or mechanical haulage. It will solve that problem of hard-running cars—on level track it runs 25 per cent easier than other improved trucks selling at the same price.

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It does not solidify in the cups, or gum up the bearings, but is a smooth lubricant that reduces friction to a minimum and saves power.

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From ore to finished product Roebling Wire Rope is subject to scientific treatment, exacting tests and skilled workmanship.

It is the product of 80 years of wire rope manufacture.

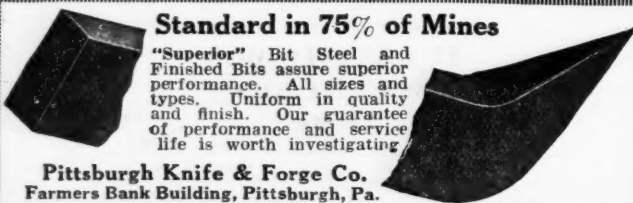
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"Superior" Bit Steel and Finished Bits assure superior performance. All sizes and types. Uniform in quality and finish. Our guarantee of performance and service life is worth investigating.

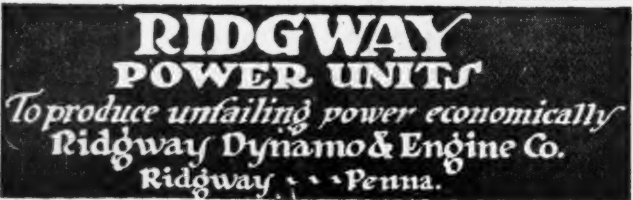
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EFFICIENT, economical hauling. Find out about storage battery locomotives for your hauling. The Ironton is the best storage battery locomotive.





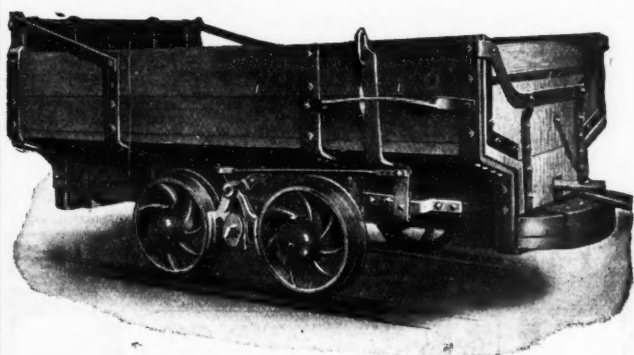


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It is the result of over eighty-five years of wheel making experience and is demonstrated by the experiences of hundreds of satisfied users.

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Established 1836  
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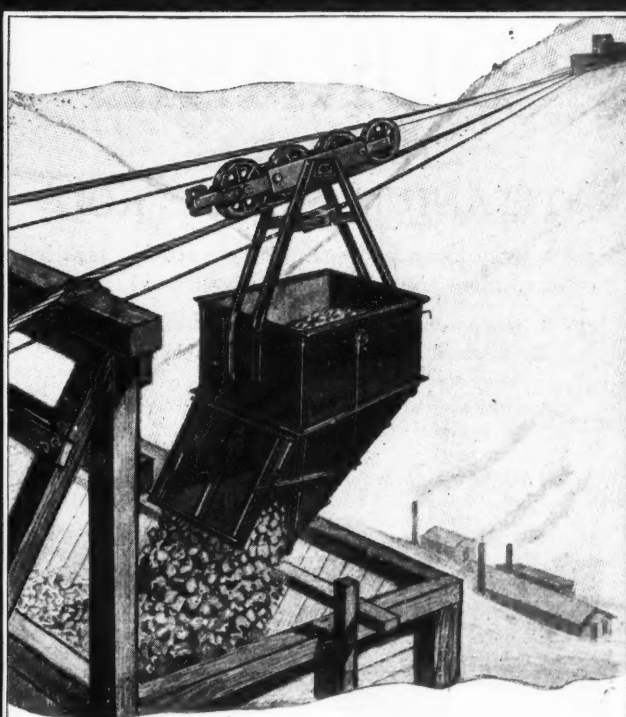
*If it's a Helmick—  
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Depend upon it—there's no such thing as a sturdier, easier going, more trouble-free Mine Car than the Helmick.

For 35 years it has been made to suit the toughest conditions — and it's made good everywhere.

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Let us know where we can reach you.*

**HELMICK**  
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When you haul coal aerially, *you're* the dictator of your tonnage—the weather-man isn't. Your aerial tramway buckets calmly deliver their guaranteed tonnage, while surface traffic is tied up tight by snow or flood, ice or mud.

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to tell us your haulage troubles.  
Ask also for Catalog No. 9.*

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**B & B**  
Two-Bucket  
Aerial Tramways

CR-277

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Fashioned from



Established 1902  
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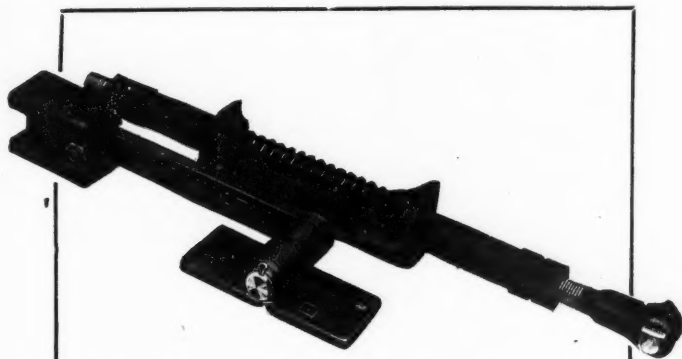
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Made of malleable iron, die formed and forged steel.  
Switch points prevented from breakage.

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OUR GUARANTEE PROTECTS

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Titanium Steel Frog

That Weir Titan Frogs meet every need for stability and permanence in modern coal mine track construction has been amply demonstrated in service for several years. The Titan is the original one-piece titanium steel frog

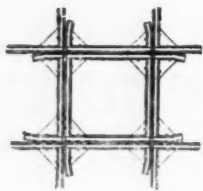
and the standard by which all others must be judged.

In common with all Weir standard track equipment Titan Frogs and complete Titan Frog turnouts are always ready for shipment upon receipt of order.

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Established 1882.  
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## You cannot discount experience

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**MINE TRACK EQUIPMENT**



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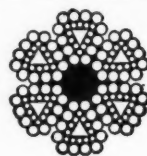
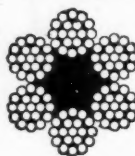
CINCINNATI  
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## Leschen Mine Hoisting Ropes

Leschen Wire Ropes for mine hoisting are furnished in both Round and Patent Flattened Strand constructions and in different grades of material. For heavy

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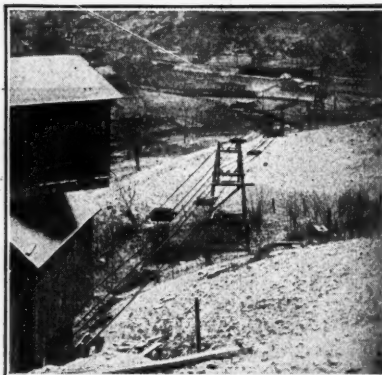
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or are your operations suspended on account of impassable roads?

Investigate hauling from mine to railroad or plant by the

**Automatic  
Aerial Tramway**

We can give you many interesting facts.

Write us.

**Interstate Equipment Corporation**  
25 Church Street, New York City



# WHAT AND WHERE TO BUY

## A Classified Index of Advertisers in this Issue

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Keystone Lubricating Co.

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Link-Belt Co.

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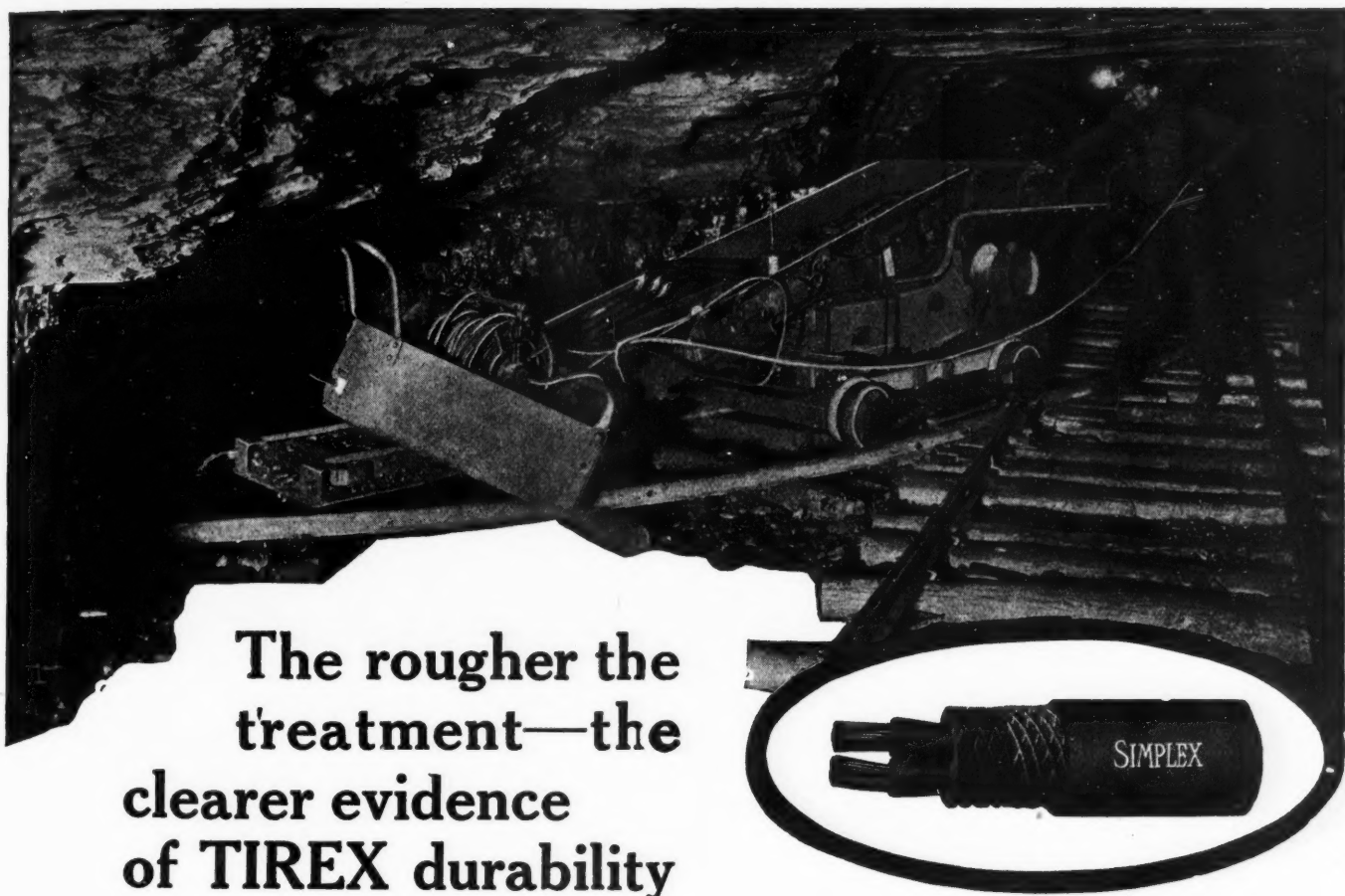
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## The rougher the treatment—the clearer evidence of TIREX durability

Give TIREX rubber-armored Cable a chance to demonstrate its endurance on your cutting machines and loaders. Watch it as it is pulled over rough, sharp edges of rock and slate or left lying in muck or acid water. Not until you see TIREX Cable at work will you fully appreciate how much punishment it will stand. The extraordinary durability of TIREX Cable is due largely to the TIREX "rubber armor"—a tough, wear-resisting sheath which prevents in-

jury to the conductors from outside causes. It is today a well recognized fact that rubber-sheathed cords and cables—when properly made—will last many times as long as cables with other types of covering.

The peculiar construction of TIREX Cable insures flexibility and eliminates the danger of kinking. Install TIREX and keep upkeep down. Let us send you a sample—or particulars—and quotations.

*We manufacture electrical wires and cables for all purposes, insulated with rubber, cambric or paper.*

### SIMPLEX WIRE & CABLE CO

MANUFACTURERS

201 DEVONSHIRE ST. BOSTON 9  
CHICAGO SAN FRANCISCO

TRADE

# TIREX

MARK

**The Simplex Cable that wears like a Cord Tire**







Monel Metal Screen in colliery of  
Legitt's Creek Coal Co., Scranton, Pa.

## Legitt's Creek Colliery Tests Prove the Economy of Monel Metal Shaker Screens

By actual records of service under exactly parallel conditions of sizing at Legitt's Creek, manganese bronze screens were outlasted 60% by Monel Metal. Other mines report still greater superiority for this tough, corrosion resistant nickel alloy.

Strictly on the equipment cost basis, Monel Metal screens save money. And they save also in labor for replacement.

Why not cut your costs by installing Monel Metal screens?

### THE INTERNATIONAL NICKEL COMPANY

67 Wall Street

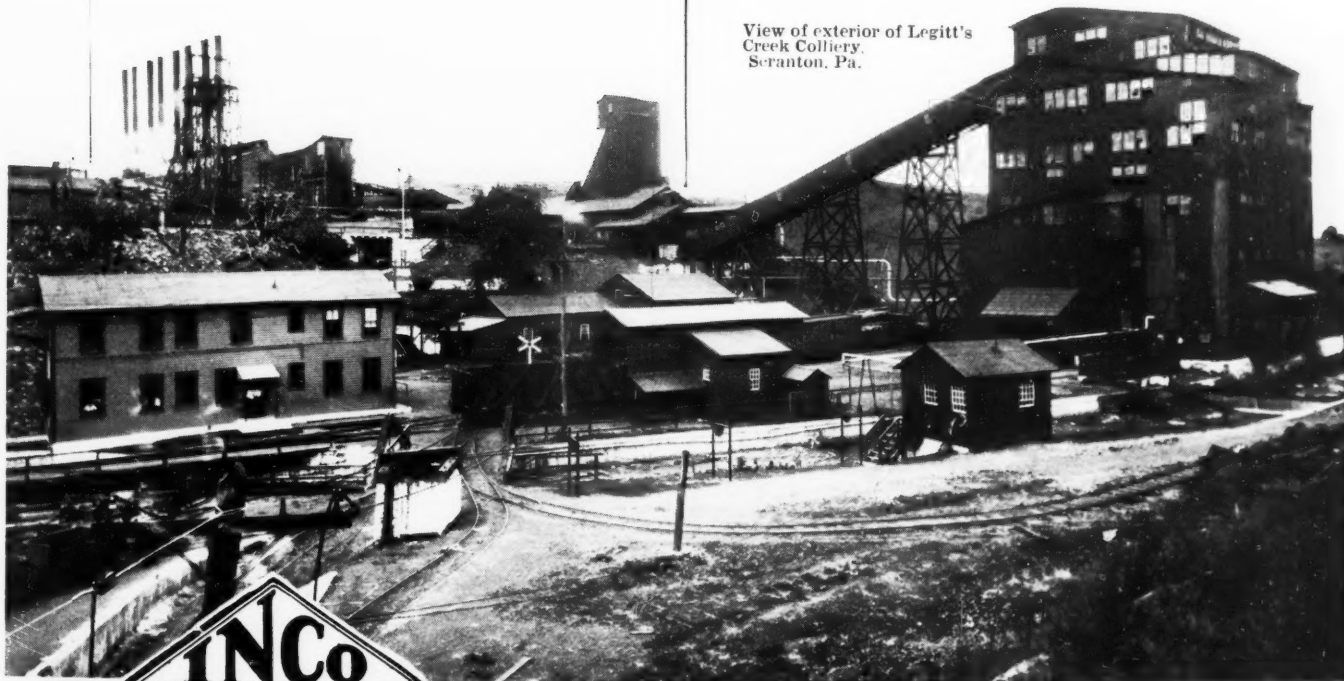
New York City

Producers also of Malleable Nickel in Sheet,  
Rod and other commercial forms

Test on Shaker Screens at  
Legitt's Creek Colliery  
Time Service on 12 Shaker Jackets Each

Manganese Bronze Days	Monel Metal Days
48	113
50	88
55	90
52	94
50	125
55	131
42	81
50	121
51	88
52	105
59	98
59	120
Average 54-3/4 days    Average 105 days	

View of exterior of Legitt's  
Creek Colliery,  
Scranton, Pa.



**INCo**  
**Monel metal**

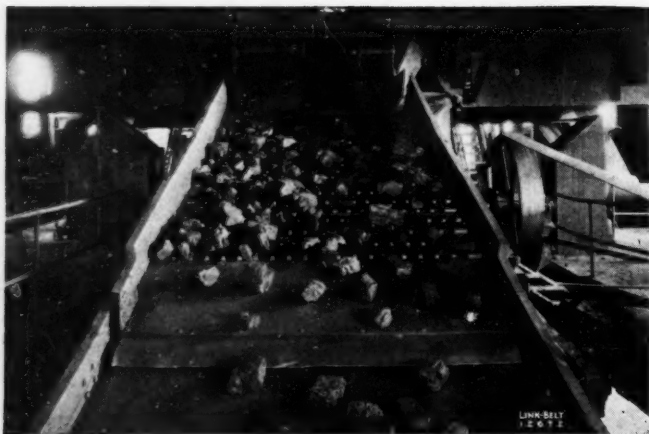


## A Recent Link-Belt Plant

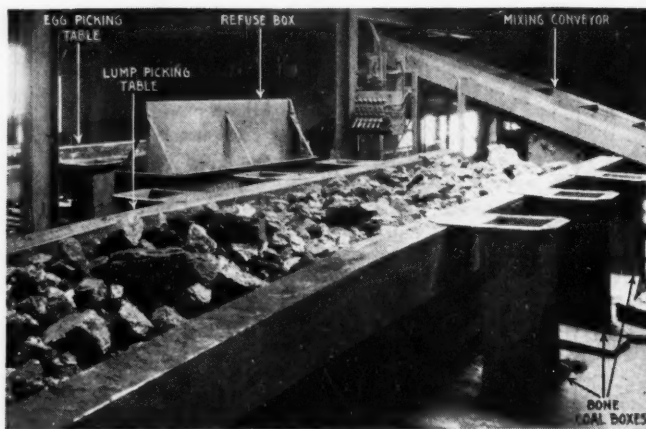
**R**UN-OF-MINE coal, at the rate of 1000 tons per hour, is dumped, elevated to screen house, separated into five sizes and loaded into railroad cars, over

Link-Belt equipment at this completely Link-Belt designed-and-built plant.

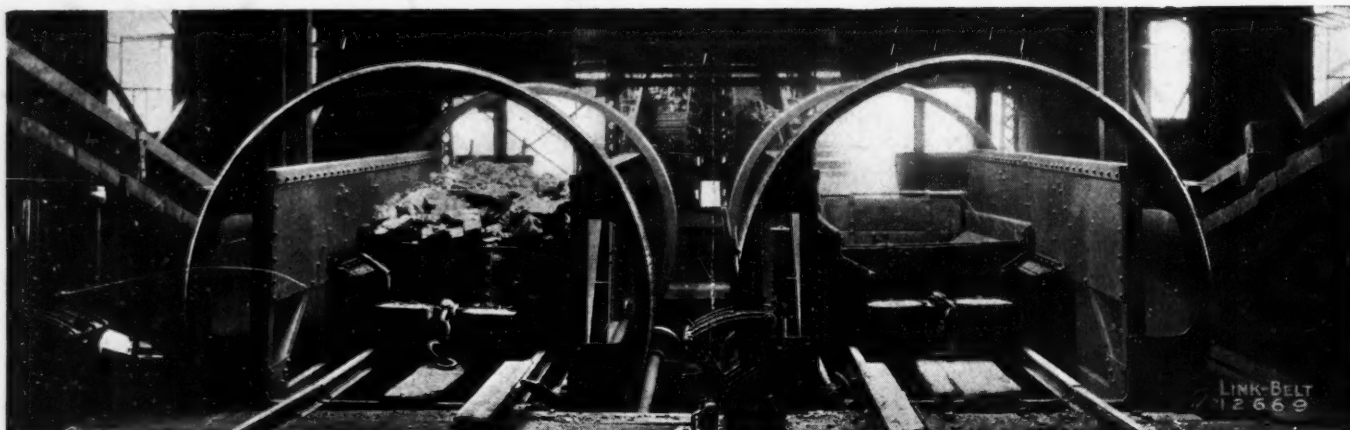
It is another practical example of Link-Belt work. What can we do for you?



Shaking Screens.



View in picking house.



Two Link-Belt Rotary Dumps.

1373

### LINK-BELT COMPANY

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Boston - 49 Federal St.  
Pittsburgh - 335 Fifth Ave.  
St. Louis - 705 Olive Street

Buffalo - 745 Ellicott Square  
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Huntington, W. Va. - Robeson-Prichard Bldg.  
Cleveland - 329 Rockefeller Bldg.

H. W. CALDWELL & SON CO.—Chicago, 1700 S. Western Ave.

LINK-BELT MEESE & GOTTFRIED CO.—San Francisco, 19th and Harrison Sts.

CHICAGO, 300 W. Pershing Road

Detroit - 4222 Woodward Ave.  
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Denver - 520 Boston Bldg.  
Atlanta - 24 Marietta St.

New York, 2676 Woolworth Bldg.

Los Angeles, 400 E. Third St.

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New Orleans - 504 Carondelet Bldg.  
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Link-Belt Limited - Toronto and Montreal

Dallas, Texas, 709 Main St.

Seattle, 820 First Ave. S. Portland, Ore., 67 Front St.

# LINK-BELT



